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TROPICAL OPHTHALMOLOGY: A REVIEW.

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Trachoma must occupy a prominent place in any retrospect of work done in connexion with those diseases of the eye that are of special interest to the practitioner in the Tropics. It must be confessed that no dramatic solution of the problems connected with the aetiology, pathology and treatment of the disease has been arrived at yet.

It is of interest to note that some writers on the subject suggest that a large number of probably widely different conditions may, at the present time, be included under the convenient term "trachoma." This applies even to the cicatricial stage of the disease. The suggestion seems reasonable enough. To illustrate the point—we are aware that the same cause is not active in every case of cirrhosis of the liver, or of broncho-pneumonia, or even of general septic peritonitis; on the contrary, the characteristic changes in these organs may result from the reaction of the tissue cells to various kinds of irritation; similarly it is quite possible that the conjunctiva may react in an apparently identical fashion to a variety of infections.

Negroes are sometimes stated to enjoy an immunity to trachoma, but Roy (1920) has found the disease to be very common amongst the blacks of Northern Africa; destructive types of the disease, too, were found to be just as common amongst these as amongst the other races.

Nicolle and Cuénod (1921) have conducted a research upon experimental trachoma in animals. They were able to reproduce the disease in the chimpanzee, in which it ran a course similar to human trachoma. Many of the monkeys proved resistant, but the Algerian baboon (*Macacus innuus*) was found to be susceptible and to be quite as satisfactory as the chimpanzee for the purpose of experiment. Their experiments suggest that flies play an important part in the propagation of trachoma. They consider that the disease is due to an invisible micro-organism, which can pass through a Berkefeld V filter, and that the signification of Prowazek's corpuscles is doubtful.

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SOLOVIEF (1921), working on experimental trachoma at Tunis, has concluded that Prowazek's corpuscles are derived from products which are the result of degeneration of the cell nucleus and that they have a real value in diagnosis. LUMBROSO (1921) suggests that they represent an aetiological factor in a specific conjunctival infection which is very frequently associated with early trachoma, and that a mixed infection is present when they are found in a trachoma patient. He found the corpuscles very abundant in all stages of non-gonorrhoeal ophthalmia neonatorum, and considers that this may be the specific infection in question.

A considerable number of papers dealing with the treatment of trachoma have appeared. Some of the measures recommended are modifications of older methods. The great value of the combined excision of HEISRATH appears to be more generally appreciated. The relief afforded by this operation in the middle stages of the disease is nearly always very striking. STAICOVICI and LOBEL (1920) recommend prolonged grattage with a cube of sugar which has been dipped in alcohol; the application is followed by the formation of a false membrane. RUSH has found glycerite of boroglycerine a useful addition to the drugs in ordinary use. DIMITRY (1921) massages the tarsal plate over a stout copper rod. The tarsus is compressed between the rod, placed in the superior fornix, and the thumb. An indurated tarsus can be made pliable in this way. ABBOUDY (1920) claims to have obtained good results from the method of galvanopuncture recommended by ABADIE. KIRKPATRICK (1921) has drawn attention to the value of a thorough stretching and exposure of the transitional conjunctiva by the injection of a syringeful of saline beneath it. Thorough applications to the membrane are thus facilitated, and if a little anaesthetic is added to the saline, they are also rendered painless. DAVID (1920) has had very striking success in the prophylaxis of trachoma, and of other forms of conjunctivitis, by the daily instillation into healthy eyes of a 1 per cent. solution of sulphate of zinc, to which is added 5 per cent. of 1 in 1,000 adrenalin chloride solution.

SERGENT (1921) states that prophylactic measures taken against ophthalmia in Algeria have been very successful. The services of the inspectors employed on antimalarial measures are employed; these use instillations of 1 per cent. nitrate of silver in the case of those who are affected by any conjunctival inflammation or discharge.

The great part played by dust and glare in the production of conjunctival inflammation has been very strikingly shown by SICHEL (1921). This writer, when investigating an epidemic of ophthalmia in Christmas Island, made a study of the meteorological records of the past fourteen years, and was able to demonstrate that the hospital admissions for ophthalmia during the same period were in excess during bright, dry weather, whilst they fell to zero when the weather was wet and cloudy.

COMBERG (1920) has reported the occurrence of a severe epidemic of conjunctivitis which was caused by contamination of the water in a well-cared-for swimming bath in Berlin. MACCALLAN and BEATON (1920) have described the peculiarities of the gonococcal conjunctivitis met with in Egypt. They state (1) that the infection is commonly derived from another conjunctiva; (2) that it is frequently subacute or chronic; and (3) that it is a less virulent disease than that met with in Europe. This is undoubtedly correct. KIRKPATRICK (1920*b*) advocates the use of strong solutions of magnesium sulphate as a local

application in cases of gonorrhoeal ophthalmia, as well as in the secondary infections of trachoma and in suppurative conditions of the cornea and eyeball. McPherson (1920) has described the types of conjunctivitis artefacta which he met with in the Mesopotamian Expeditionary Force.

A curious form of subconjunctival granuloma has been met with in Central China by McAll (1920). Tumour-like masses, free from inflammation, grow between the eyeball and the lids. By degrees the conjunctiva and the lids are themselves involved, and the masses bulge forward very markedly. The bulk of the tumour is composed of lymphocytes. (Kirkpatrick has seen almost identical appearances in the palpebral and bulbar conjunctiva of a Hindu woman in Madras. Both eyes were affected. In this case the mass histologically resembled amyloid, but failed to exhibit the staining reaction of amyloid; the absence of cells and new-formed vessels was very striking.)

A case of ocular sparganosis is reported from Annam by Motais (1918). The tumour was the size of a bean, and had been accompanied by occasional attacks of redness of the eyes and oedema of the lids.

Pacheco-Luna (1920) has drawn attention to the presence of eye lesions due to an infection by the filarial nematode, *Onchocerca volvulus*. The infection occurs in Guatemala and causes tumours of the skin, known there as "Coast Erysipelas"; the eye lesions are dependent on these, and vary from a condition similar to the superficial punctate keratitis of Fuchs to a severe iridocyclitis. Treatment of the ocular condition is useless until the skin tumours have been removed.

An epidemic in Madras of a peculiar form of macular keratitis has been reported by Kirkpatrick (1920*a*). The disease is similar to the forms described by Herbert and by Westhoff. Its chief characteristic is the extraordinary lack of pain and the vascular reaction associated with it.

Macrae (1921) has described a corneal affection met with amongst the natives of South Arabia. A little group of glassy nodules was found to occupy an area in or below the equatorial corneal meridian. The changes were unaccompanied by any vascular reaction and iritis was absent.

Wright (1922*a*) has very fully discussed the problem of keratomalacia as found in Southern India. He considers that the disease is a complex, generalized one, in which the liver, thyroid and intestine play an important part; it is practically always associated with deficiencies in the diet of a general type. Chlorides of sodium, calcium and ammonium, codliver oil, liver, and thyroid are all important remedies. Codliver oil is quite indispensable. Many patients are unable to digest codliver oil when given by the mouth and inunctions of the oil should then be used. It is unnecessary to draw attention to the importance of administering similar treatment to the nursing mother of a baby affected by keratomalacia. Blake (1921) has reported the occurrence of proptosis, caused by an intra-orbital haemorrhage in infantile scurvy. The cause of the condition may readily escape recognition; in one case, at least, it was thought to have been due to "rheumatism." The lids and the subconjunctival tissue were unaffected.

Wright (1922*b*) has met with a case of *Rhinosporidium kinealyi* of the lachrymal sac, and also some cases of the same disease affecting the conjunctiva. The latter are of special interest, as the condition was discovered almost accidentally in the course of a routine examination of a school. He has made the very important observation that

a collyrium of 2 per cent. tartar emetic was effective in causing the disappearance of the polypi. If the drug is found equally effacacious in the treatment of rhinosporidium of the naso-pharynx, many patients will be saved much suffering and inconvenience.

Roy (1920) has examined 418 negro sufferers from sleeping sickness, and states that 19 of them were suffering from optic atrophy caused by the injection of atoxyl or a similar drug. These figures are an indication of the danger incurred by the use of such drugs. Kopke (1922) suggests that the optic atrophy is caused by the liberation of endotoxins owing to the destruction of trypanosomes by the atoxyl rather than by the direct action of the drug. The patient, however, might regard this as being merely of academic interest.

A considerable number of cases of blindness due to quinine poisoning have been reported. These afford ample proof of the danger to sight which results from the use of heroic doses of quinine. Most writers now consider that the drug causes loss of vision by its toxic influence on the retinal cells as well as by its action upon the retinal arteries. It is probable that the retinal cells are rendered more vulnerable to toxic influences by the interference with their blood supply.

Wood (1920) has remarked an inability to stand sunlight and an inability to read in many patients who had suffered from malaria. The accommodative power of these patients appeared to be diminished, and convex glasses of a dioptre, or sometimes more, were needed for reading. The symptoms of photophobia lasted for about a week, but it was about a month before the accommodation fully recovered. Similar symptoms were observed after influenza ; in this case recovery was more slow. The interference with accommodative power as a result of any debilitating influence is well known, and it is possible that we need look no further than this for the explanation of the above observations.

Barraquer's method of removing the lens in its capsule has attracted a considerable amount of attention and has impressed some observers. The removal by traction of the lens in its capsule must necessarily cause less disturbance of the vitreous body than its expulsion by pressure on the globe, and, in the hands of an experienced operator, is therefore likely to give better results than the ordinary intracapsular expression by Smith's technique. The apparatus is, however, somewhat complicated, and a surgeon, working in remote parts, might find it difficult to keep the delicate mechanism in proper working order. It must be recognized that this operation requires just as much skill for its successful performance as any other form of operation for cataract. The reviewer has seen Professor Barraquer at work and can testify to the extraordinary skill he displayed, and to his absolute sincerity ; but he was far from obtaining the impression that the new method will be a success in the hands of a large number of ophthalmic surgeons. Indeed, he feels strongly that no one should attempt it until he has acquired facility with the older and simpler method of extraction.

Many surgeons now use a " bridge conjunctival flap." The section is made as if it was intended to form an ordinary conjunctival flap ; this flap, however, is not completed, but is left attached at its scleral extremity. A bridge of conjunctiva, connecting the corneal and scleral lips of the wound, is thus formed. The lens can be delivered and manipulations can be carried out beneath the conjunctival bridge. Accurate adaptation of the edges of the wound is ensured during healing and this technique has great advantages in many cases,

especially in very old people. It is, however, sometimes a little more difficult to effect the delivery of the lens when this flap is used (a dark, flat nucleus is specially likely to cause trouble), and care should be taken to make the section rather larger than usual.

WRIGHT (1921), working on the same lines as VAN LINT and VILLARD, has found that blocking of the facial nerve by novocaine—in order to cause a relaxation of the orbicularis—is very useful in patients who appear likely to squeeze their eye violently during an operation for cataract.

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KIRKPATRICK (1920*a*), xviii, 83.
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WRIGHT (1921), xix, 63.
—— (1922*a*), xix, 714.
—— (1922*b*), xix, 711, 712.
WOOD (1920), xviii, 85.

* References are to summaries in the *Tropical Diseases Bulletin.* Dates in parentheses refer to year of publication of original papers.

PLAGUE.

i. ARMSTRONG (W. G.). **The Present Plague Outbreak in Sydney.**—*Med. Jl. Australia.* 1922. May 20. 9th Year. Vol. 1. No. 20. pp. 546–552.

ii. FERGUSON (E. W.). **The Plague Epidemic.**—*Ibid.* pp. 552–554. With 8 text figs.

i. The first outbreak of plague in Sydney was in 1900 ; 300 persons were attacked and the mortality was 34 per cent. Of the patients admitted to hospital 71 were treated with the Roux-Yersin serum ; the mortality among this number was 24 per cent.

The first intimation of the outbreak described by these authors was a statement in the Sydney press on September 15, 1921, that a death from plague had occurred in Brisbane on August 23. There were no further developments until September 19. In the afternoon of that day six dead rats were found beneath the cargo in No. 4 hold of the *Wyreema*, just arrived. One of these rats was infected with plague. The others were too putrid for examination. After fumigation a large number of dead rats were sent to Dr. Armstrong ; 11 were infected with *B. pestis*. They were all black rats. On September 22 a grey rat (*R. norvegicus*) caught on the wharf was found to be infected. Thirty-eight infected rats were taken in business premises near the A.U.S.N. wharf and one case of human plague occurred in the same area. The infection spread to Sussex Street and to the Paddington area. Sixteen cases of human plague are described. They were treated with an antiplague serum, prepared in the Biological Institute of Australia, with very satisfactory results. Of the 16 cases, two died before they could be removed to the Coast Hospital ; a third reached the hospital moribund and died two hours later. A fourth case was not diagnosed until convalescence had set in, and so was not sent to hospital. Of the remaining 12, one mild case did not receive any serum. Ten patients treated with the serum recovered and one died.

ii. The text figures in Dr. Ferguson's paper show : *B. pestis* in a smear from a bubo and a specimen of bacilli from a culture, *Ctenocephalus felis*, *C. musculi*, *P. irritans*, *X. cheopis*, and a microscope slide showing the proventricular valve of *C. fasciatus*. Of 15 cases all but two gave *B. pestis* in smears or cultures. In five cases the findings were confirmed by animal inoculations. Serological tests were made in six cases, and in four the blood serum of the patient agglutinated the *B. pestis*. In rats the disease takes the form of septicaemia with, or without, a bubo. Buboes were stated by the Indian Plague Commission to be present in 85 per cent. of the rats examined and to be most frequent in the cervical region.

J. H. Tull Walsh.

URIARTE (Leopoldo). **Un trabajo sobre la peste de Oriente en el Uruguay.** [A Work on Plague in Uruguay.]—*An. del Depart. Nac. Hig.* Buenos Aires. 1921. Sept. & Oct. Vol. 27. No. 5. pp. 233–242.

This paper is itself of the nature of a description or résumé of a previous work entitled " History of Bubonic Plague in Monte Video," by Dr. ESPIRO, Director of the Monte Video Health Department. He states that the ship *Highland Prince*, from Antwerp and London, arrived there in October, 1900, having had five cases of plague on

board, and stupefied or dead rats. Soon afterwards dead rats were seen at the Customs House of Monte Video, and in January, 1901, an overseer was taken ill with bubonic plague and died. Three more cases occurred that year, and until 1910 a few cases arose each year. During the succeeding five years there were 96 cases, with 39 deaths. Isolation and disinfection were the measures carried out; but little attention was given to rat destruction, as that was regarded as waste of time and money.

The author points out that plague epidemics rise and die down, and the people, thinking that it has disappeared for good, express surprise and fear when fresh cases occur, and are under the impression that there has been a reintroduction, whereas it has been maintained among the rats. He, therefore, is of opinion that all the cases have in reality come from the first importation more than twenty years ago, and that, instead of closing down the railways and stopping traffic, it would be better to institute a rat campaign.

[This paper illustrates and emphasizes the importance of thorough rat destruction in a ship that has once had plague on board. There are rat "carriers" as well as human "carriers."—J. H. T. W.]

H. Harold Scott.

DE FARIA (José Alberto). **Casos de peste em Lisboa em 1920.**—*Med. Contemporanea.* 1921. Sept. 18, 25 & Oct. 2. Vol. 39. Nos. 38, 39 & 40. pp. 297–303, 305–309 & 313–318.

In October, 1910, plague was introduced into Lisbon from the Azores by a ship's stoker. The disease spread and was not stamped out till June, 1911. There were, the author states, "some tens of cases" in all, mostly of a benign type, the few deaths occurring among the early cases. The existence of an epizootic among rats was established. In 1914 there was a fresh outbreak, 10 cases occurring, with 9 deaths, eight of the fatal cases being of pneumonic type. In March, 1915, 4 cases occurred, all fatal. In December, 1916, and June, 1917, the disease appeared again, the number of cases being respectively 3 with 1 death and 13 with 4 deaths. No further cases occurred until October, 1920, when there was a fresh and much more serious outbreak—114 cases with 34 deaths, among the latter being 10 cases in which the patient was found dead in his home untreated. No evidence of reimportation could be found to account for the successive outbreaks, and the author is of opinion that the explanation is to be found in a continuing epizootic among rats. During the 1920 epidemic 64 cases came under the author's treatment, which he classifies as follows, according to type: Bubonic 60, Septicaemic 2, Mitis 2. Serum treatment was tried extensively with serum obtained from the Pasteur Institute in Paris and from that at Berne. In both cases the results were disappointing.

F. S. Arnold.

VAN LOGHEM (J. J.). **Huisrat en pestbestrijding in de 17de eeuw.** [House Rat and Combating of Plague in the Seventeenth Century.]—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. No. 13. pp. 1275–1279.

Prof. Van Loghem cites from an old French book on plague (Pieces diverses de differens auteurs concernant les remèdes et les precautions publiques et particulières qu'on peut prendre contre la peste; et la conduite chrétienne que l'on doit garder dans les tems de contagion),

which appeared at Marseilles in 1721 and contains reprints of seventeenth-century publications. It appears once more that rats were numerous in those days and were a definite menace to grain stocks, and that rat corpses were reckoned to belong to the regular household refuse. Rat corpses were commonly found during cleaning of plague houses, whilst it may be presumed that the methods recommended in the same book for killing of rats by fumigation were not very efficacious. The rat corpses may therefore have been those of plague rats.

The conditions in the seventeenth-century houses, where the walls were covered with straw mats, etc., the author thinks, strikingly resemble those in the plague houses he saw in Java.

Though direct proof of the relation between rat plague and human plague in former epidemics cannot be given, the intimate contact between man and rat in those days suggests such a relation.

W. J. Bais.

RIGOLLET (L.). **A propos de l'épidemiologie de la peste.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 502–506.

Refers to the necessity for destruction of rats and to the value of prophylactic anti-plague vaccination. The author states that :—

The opinion is anchored in the mind of the people of Senegal that one must not "vaccinate" during an epidemic because vaccination is followed by a dangerous phase of sensitization. This opinion is unfortunately exploited by the opponents of protective inoculation. [This has been perhaps due to want of a satisfactory vaccine in Senegal.] It is not forbidden to hope that a good vaccine will be found in the near future. I desire that on that occasion our preventive action, which should be rapid and in massive doses, shall not be interfered with by a spirit such as that which I have noted.

Dr. Le DANTEC agreed with the author. Dr. LEGER said :—

I do not pretend that anti-plague vaccine confers an absolute immunity unlimited in duration. There is no vaccine which attains this ideal standard. At the moment I am experimenting concurrently with the aqueous vaccine made by the Institute of Biology of French West Africa and a new vaccine. This is the lipo-vaccine prepared by Le MOIGNIC. . . . It contains 5·0 mgm. of microbes per cc., say four to five thousand million germs at least. Subcutaneous injection of 1·0 cc. is well borne and rarely gives any reaction. The future will tell us its prophylactic value.

J. H. T. W.

KIAMIL (Mehmed). **Étude sur la peste des vaccinés.**—*Bull. de l'Administration sanitaire des Frontières.* 1922. Mar. 20. No. 12. pp. 257–260.

The author had charge of 111 cases of plague, eight of whom had been vaccinated with an anti-plague vaccine prepared at the Bacteriological Institute, Constantinople. It contained 750 million dead germs :—

No. 1,	vaccinated	once,	16 days	before	plague	broke	out.	
,, 2,	,,	twice,	23	,,	,,	,,	,,	,,
,, 3,	,,	once,	6 months	,,	,,	,,	,,	
,, 4,	,,	once,	15 days	,,	,,	,,	,,	
,, 5,	,,	twice,	1 year	,,	,,	,,	,,	
,, 6,	,,	once,	6 months	,,	,,	,,	,,	
,, 7,	,,	once,	3 ,,	,,	,,	,,	,,	
,, 8,	,,	once,	1 year	,,	,,	,,	,,	

The clinical signs and the course of the malady were very different among these vaccinated cases from what was seen in the unvaccinated. Among the former no deaths occurred; but of 103 unvaccinated, 51 died (49·5 per cent.). The reduced severity of the symptoms and local lesions renders diagnosis more difficult among the inoculated, and in many cases it can only be decided by bacteriological examination. In the uninoculated the bacillus is generally found in smears which have been stained, and cultures are generally successful. In the vaccinated patients it was rare to find the bacillus; here and there one might be seen; cultures also were less frequently positive. It is noticed also that suppuration of buboes does not occur as frequently among vaccinated patients as among the uninoculated. Only three out of the eight protected persons showed signs of suppuration.

J. H. T. W.

PICCININNI (Francesco). **Il contagio della peste alla luce di un recente episodio di peste in Italia.** [The Contagion of Plague in the Light of a Recent Outbreak in Italy.]—*Ann. d' Igiene.* 1922. Apr. Vol. 32. No. 4. pp. 264–276.

Traces infection to the usual cause, viz.: infected rats entering Naples in boats trading with plague-infected areas. These rats passed on the infection to the rats of the Port of Naples. The author next describes investigations into immunity in rats in an infected area. He inoculated 40 rats (*M. decumanus*) from the Port of Naples, 40 from a large mill at Taduccio, and 20 from the town of Naples. Of the 80 from the port and the mill 64 seemed immune. Of the 20 taken in the town all died. Infection through grain and its derivatives is alluded to, and the author believes that the plague bacillus may be present in the grain. The following table is given:—

TABLE II.

Rat Examination in the Port of Naples, 1921.

—	Rats captured.	Rats found dead.	Found Infected.		
			M. musculus.	*M. rattus.*	*M. decumanus.*
Jan.–Mar. ..	1,140	19	—	—	—
Apr.–June ..	1,932	3	—	—	—
July–Sept. ..	2,597	134	68	46	20
Oct.–Dec. ..	2,157	507	31	1	—
			99	47	20

The usual preventive measures were instituted.

J. H. T. W.

PICCININNI (Francesco). **Le difficoltà della diagnosi batteriologica della peste in alcuni casi di eccezione.** [Difficulty of Bacteriological Diagnosis in Exceptional Cases of Plague.]—*Ann. d'Igiene.* 1922. Apr. Vol. 32. No. 4. pp. 277–280.

Having noted that the usual methods of diagnosing plague supply *B. pestis* from the bubo, with confirmation by culture and pathological reaction in guinea-pigs, the author points to the difficulty of isolating the bacillus when mixed—in the buboes—with other germs and to a similar difficulty in what he calls pestis minor. He describes cases which were clinically plague but in which he failed to find the bacillus under the microscope and in which the inoculated guinea-pigs gave no reaction. Some of the cultures were positive, but when injected into guinea-pigs showed reduced virulence.

J. H. T. W.

DELBREIL (P.). **De quelques constatations necropsiques en rapport avec la clinique dans la peste pulmonaire primitive.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Apr. Vol. 2. No. 4. pp. 94–106.

As the result of the author's observations in 32 post-mortem examinations of persons dying from plague pneumonia, he finds that the condition of the lungs is one of broncho-pneumonia with small patches of hepatization, generally at the base. Pleural effusion was general with few adhesions. In some cases there was little more than a general congestion. Dr. Delbreil found pericarditis with effusion, which, as he says, does not appear to have been previously noticed. During life the sputum rapidly became blood-stained. During the discussion Major NOGUE remarked that failure to diagnose pneumonic plague was often excusable and that cases had been sent to hospital in Dakar as ordinary bronchitis. The plague bacillus was readily isolated. The expectoration is very variable. Sometimes the patient dies before any appears; generally the characters are typical: reddish or greenish jelly or muco-purulent spotted with blood. In two cases there was haemoptysis. Dr. HECKENROTH stated that the cocco-bacillus could always be obtained from the sputum.

J. H. T. W.

COLLIGNON. **État actuel de la prophylaxie et du traitement de la peste.** —*Arch. Méd. et Pharm. Milit.* 1922. Apr. Vol. 76. No. 4. pp. 451–463.

[The early part of this paper repeats facts already noticed: this *Bulletin,* Vol. 16, p. 43 (MONZIOL and COLLIGNON); see also FICHET, Vol. 17, p. 390.]

Vaccines.—Collignon reports that the vaccine prepared at the Pasteur Institute, dose 1·0 cc., gives immunity, but that it is better to give a second injection, after four or five days, of 2·0 cc., and even a third injection of anti-plague vaccine, 4·0 cc. The immunity thus conferred lasts about five months, and where plague is epidemic vaccination should be repeated every six months. Infants may be protected by injections of 0·5 cc.; these injections with five-day intervals.

Serum Vaccination.—The immunity conferred by anti-plague vaccine is delayed for several days, and for that reason the inoculated should be protected from any chance of infection. To overcome

this difficulty, CALMETTE and SALIMBENI inject a mixture of anti-plague serum and anti-plague vaccine: 5·0 cc. serum on one day and 2–3·0 cc. vaccine on the following day. BESREDKA has prepared a sero-vaccine without excess of the serum: this is an emulsion of plague bacilli killed at 60° C. in physiological saline to which a strongly agglutinating, non-heated serum is added. The deposit is decanted, made into an emulsion with saline and heated at 54° C. Dose for injection, 5·0 mgm. of the sensitized bacterial bodies.

Preventive. Sero-therapy.—Where it is necessary to act quickly serum alone may be used for prophylaxis; dose from 10·0 cc. to 20·0 cc. subcutaneously. The immunity thus conferred lasts about eight days.

Treatment.—The first efforts to prepare a serum were made by ROUX, YERSIN, CALMETTE and BORREL in 1895. The serum may be injected subcutaneously or into the veins, the latter method being the most satisfactory. It should be given as soon as possible and continued until a curative effect is seen.

SIMOND has given the following figures for Hindus: those treated on the first day had a mortality of 20 per cent.; those treated on the third day, 36 per cent.; fourth day, 66 per cent.; if only on the fifth day, the mortality was 100 per cent. 100 to 150 cc. should be injected subcutaneously or 80 to 100 cc. intravenously for the initial dose; subsequent doses will be based on the condition of the patient. The maximum amount which has proved curative varies. CALMETTE and SALIMBENI used 320 cc.; DORIZA, 600 cc.; CASTEL and LAFONT injected as much as 1,140 cc. in six doses.

CHOKSY, in Bombay, proved the value of anti-plague serum: the death-rate among 200 cases so treated was 63·5 per cent. Among 200 cases of equal gravity not treated with serum it was 73·8 per cent. [*cf.* McCOY and CHAPIN, this *Bulletin*, Vol. 16, p. 430.]

J. H. T. W.

i. BONREPAUX. **Note sur un cas de peste septicémique avec ictère. (Observation clinique et autopsie.)**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1921. July. Vol. 3. No. 17. pp. 115–117.

ii. BAUS. **Quelques chiffres sur le début de l'épidemie de peste actuelle.** —*Ibid.* pp. 112–114.

i. Describes at length a fatal case of plague with pleural and peritoneal effusion and acute degeneration of the liver. The man, aged 28, was admitted to hospital on July 5, 1921, and died the next day at 7 a.m. Numerous plague bacilli were found in the lungs and liver.

ii. Statistics of an epidemic already noted [see this *Bulletin*, Vol. 19, p. 367 (Plague in Dakar)].

J. H. T. W.

BRITES (Geraldino). **Sur un cas d'amygdalite pesteuse primitive.**—*C.R. Soc. Biol.* 1922. May 13. Vol. 86. No. 17. pp. 1044–1045.

The case described is that of a man found dead in the street. The post-mortem examination revealed severely congested and inflamed tonsils, with marked sanious oedema passing into the pharynx and down into the lungs. Spleen and liver were implicated. The lymphatic glands of the neck and chest, groin and axilla were not affected. Bacteriological examination was made and the tissue of one tonsil

inoculated into a guinea-pig, which died between the third and fourth day. In the spleen of this animal *B. pestis* was found. Sections of the other tonsil were made in which the plague bacillus appeared in large numbers.

J. H. T. W.

FORGUES. **L'hélio-chromothérapie. Ses applications en médecine d'armée. Ses résultats dans le traitement du bubon pesteux.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1919. Oct. Vol. 1. No. 3. pp. 15–27.

Describes the general technique employed and gives details of a case of bubonic plague in which the open buboes healed rapidly under the influence of red light. The patient had been in hospital from January 11, 1918, and the sores were indolent when the coloured light treatment was begun in June.

J. H. T. W.

i. MANSOOR (Ram). ii. SIMPSON (W. J.). **Bubonic Plague treated with Neo-Salvarsan.** [Correspondence.]—*Brit. Med. Jl.* 1922. July 22. pp. 127–128; July 29. p. 190.

i. The case reported is that of a young man, about 22, with a painful bubo in the left groin, the fluid from which proved positive for *B. pestis*. He was seen by Dr. Mansoor on May 11, three days after the onset of the disease; temperature 104° F. At 3 p.m. of that day 0·45 gm. neosalvarsan in 10 cc. distilled water was injected intravenously, with 0·5 cc. pituitary extract given subcutaneously. The same evening the temperature began to fall and the symptoms (headache, sinking feeling and restlessness) began to abate. On May 15 the temperature was 100° F.; on the 16th it was normal. The bubo was treated by applications of belladonna and glycerine. [It is hardly correct to say that "we have no reliable serum for curative treatment" of plague. Reference to the volumes of this *Bulletin* will supply information as to the use of anti-plague serum which may be obtained in India.]

ii. Professor Simpson rightly says that such a statement as that made by Dr. MANSOOR "is apt to do an immense deal of harm, because anyone reading it who has not had experience of the great value of Haffkine's prophylactic in outbreaks of plague would likely conclude that the inoculations are not only useless but also dangerous." The mishaps to which Dr. MANSOOR refers happened 20 years ago, and were due to a faulty bottle of vaccine. Dr. Simpson's testimony is of considerable value, owing to his knowledge of plague in India. He writes: "For populations exposed to infection of bubonic plague and living under crowded and insanitary conditions, my experience is that inoculation with Haffkine's prophylactic is one of the quickest and most powerful weapons we at present possess . . . and that it is quite harmless provided proper precautions are taken in its application."

J. H. T. W.

LEGER (Marcel) & BAURY (A.). **Pestis minor expérimentale des rats blancs.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 506–509.

The strain of *B. pestis* used, "Konaté," came from a human case of plague and was cultivated since May, 1921, on agar. Injected

subcutaneously or rubbed into the mucous membrane of the nose and mouth, it killed white rats and shrews, the latter living, generally, a day or so longer than the rats.

J. H. T. W.

NEGRONI (P.). **Avantages de la préparation du sérum antipesteux d'après la méthode Lustig-Galeotti.**—*Bull. de l'Administration sanitaire des Frontières.* Constantinople. 1922. Feb. 5. No. 9. pp. 161–167.

In this method the nucleo-protein endotoxin of the plague bacillus is extracted and then employed to immunize the horse. It is claimed that the serum obtained has the same value as an anti-plague vaccine prepared by injections of living or dead bacilli, while it excludes any possible infection due to working with *B. pestis.*

The plague bacillus is cultivated on agar at 37° C. After 24 hours the colonies are washed off with 0·3 per cent. solution of caustic potash—about 40 cc. for each Petri dish. The emulsion thus obtained is left at 37° C. for about 10 hours, during which time the liquid becomes mucilaginous and opalescent. It is next rendered acid, with 1 per cent. acetic acid, until floccules of precipitated nucleo-protein appear. This precipitate is allowed to settle, centrifuged, decanted and washed with sterile distilled water. The precipitate is then placed in sterile capsules and dried in a vacuum. The dried nucleo-protein will, according to LUSTIG, retain its properties for several years. The initial dose employed to immunize the horse is 0·005 mgm. dissolved in 1 per cent. solution of carbonate of soda. For each cc. of solution, 2·5 mgm. are taken; the solution is added little by little, with trituration in a mortar.

A bibliographical index is given at the end of the article.

J. H. T. W.

BOMBAY. **Report of the Bombay Bacteriological Laboratory for the Year 1920.** [HODGSON (E. C.), D.S.O., D.P.H., D.T.M. & H. (Camb.), I.M.S.]—9 pp. 1922. Bombay: Government Central Press. [Price 3 annas.]—Part I.

[For notice of Report for 1919 see this *Bulletin,* Vol. 17, p. 395.]

The total number of doses of anti-plague vaccine issued during the year was 1,468,729. A table shows the number of cases that occurred during an epidemic in Mombasa and the number of inoculations carried out each week. As in previous years, a large number of rats were examined and the percentage infections are tabulated.

J. H. T. W.

i. LEGER (Marcel) & BAURY (A.). **Essai de vaccination contre la peste par la voie buccale.**—*C. R. Soc. Biol.* 1922. July 8. Vol. 87. No. 25. pp. 444–446.

ii. NOC (F.). **Vaccination contre la peste par la voie buccale. A propos de la note de Leger et Baury.**—*Ibid.* July 15. No. 26. pp. 493–494.

i. The authors report experiments on a monkey, a rabbit, and a guinea-pig (with controls) which seem to favour the view of an acquired immunity against plague when an animal, sensitized orally with ox bile, is given doses of anti-plague vaccine by the same route. [These

experiments are interesting ; but this method is not fully proved and is unlikely to supersede the ordinary method of anti-plague vaccination.]

ii. The author made experiments in oral "vaccination" at Dakar (Senegal) in 1921, using an oil-vaccine containing plague bacilli killed by heat. It seemed that this method gave uncertain results and that any immunity conferred was of very brief duration.

J. H. T. W.

LUISI. **A propos du sérum de Yersin.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. June. Vol. 2. No. 6. pp. 158–167.

Dr. Luisi describes graphically the serious symptoms which followed upon the prophylactic injection of 5 cc. of Yersin's serum : urticaria, oedema of face, vomiting, etc., with some fever. During the discussion Major NOGUE remarked that in 1919 he received an injection of 20 cc. of anti-plague serum ; he also suffered from urticaria with rise of temperature and faintness and pain. These symptoms lasted three days, after which he recovered. Major ABATUCCI recorded similar but milder symptoms in his own case. Other instances are given of grave reaction after inoculation with Yersin's anti-plague serum. The author insists that all persons "vaccinated" should be warned that such untoward symptoms may appear. It is necessary to rest for some time after the injection and to avoid alcohol. In some instances the serum itself may be defective.

J. H. T. W.

i. NEVEU-LEMAIRE. **Les grandes endémo-épidémies intercoloniales : la peste.**—*Presse Méd.* 1922. May 31. Vol. 30. No. 43. pp. 893–898. With 3 text figs.

ii. SINISI (Guido). **Di un' Epidemia pestosa in Somalia. (Agosto-Novembre 1921.)**—*Giorn. di Med. Milit.* 1922. July. Vol. 70. No. 7. pp. 326–330.

iii. DE GOYON (J.). **L'épidémie de peste de Tamatave (Février–Avril 1921).**—*Ann. d'Hyg. publique et de Méd. légale.* 1922. March. 4th Ser. Vol. 37. No. 3. pp. 137–156.

iv. DELBREIL (P.). **Vaccination antipesteuse.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1919. Nov. Vol. 1. No. 4. pp. 13–26.

v. THOULON & FORGUES. **L'abcès de fixation dans la peste.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Jan. Vol. 2. No. 1. pp. 4–23.

vi. HORNABROOK (R. W.). **Plague Experiences.**—*Med. Jl. Australia.* 1922. Apr. 15. 9th Year. Vol. 1. No. 15. pp. 408–410.

vii. SMILLIE (W. G.). **Bacillos semelhantes ao da peste encontrados nos ratos da cidade de São Paulo.** [Bacilli resembling *B. pestis* found in Rats in San Paulo City.]—*Ann. Paulist. Med. e Cirurg.* 1921. Sept. & Oct. Year 9. Nos. 9 & 10. pp. 161–165.

viii. CLEMOW (F. G.). **Des formes cliniques de la peste.**—*Bull. de l'Administration sanitaire des Frontières.* Constantinople. 1921. Oct. 5 & 20, Nov. 5 & 20 & Dec. 5. Nos. 1, 2, 3, 4 & 5. pp. 1–8 ; 17–28 ; 39–44 ; 57–61 ; 73–77.

i. A compiled history of plague epidemics with map of distribution. Figures of rats and of three fleas, *X. cheopis*, *C. fasciatus* and *P. irritans*, are given.

ii. Describes an epidemic and the sanitary and prophylactic measures employed. Contains nothing new.

iii. A paper describing in detail the epidemic already noticed, see this *Bulletin*, Vol. 19, p. 370.

iv. The author discusses anti-plague vaccination in various aspects and concludes in its favour.

v. A long paper followed by an inconclusive discussion on the value of counter-irritation or "fixation" abscesses, with, or without, the use of anti-plague serum.

vi. A paper read at a meeting of the Victorian Branch of the British Medical Association. Interesting, but does not contain anything new.

vii. Already noticed under CINTRA (A. P. de Ulhôa), this *Bulletin*, Vol. 18, p. 349, and Smillie (Wilson G.), Vol. 17, p. 398.

viii. An article published in New York and in Constantinople in 1900.

J. H. T. W.

CLEMOW (F. G.). **La peste, le choléra, le typhus exanthématique en Turquie et dans les pays limitrophes en 1920 et 1921.**—*Bull. de l'Administration sanitaire des Frontières.* Constantinople. 1922. Apr. 5, 20, & May 5. Nos. 13, 14 & 15. pp. 275–279; 295–299; & 315–318.

PULGHER (F.). **Die Anwendung der Thermopräzipitationsreaktion bei der Pestdiagnose und der Agglutination zur Bestimmung pestverdachtiger Stämme.** [Thermo-precipitation Test in Diagnosis of Plague and Recognition of Strains by Agglutination.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol 26. No. 6. pp. 165–175.

CHOLERA.

MACKIE (F. P.), with TRASLER (George). **Laboratory Records from Mesopotamia. No. III. Cholera.**—*Indian Med. Gaz.* 1922. Apr. Vol. 57. No. 4. pp. 121–125.

A somewhat belated account of laboratory work done in 1916 and 1917. With reference to infection from fruit, the authors' conclusions were :—

"1. The inside of fresh, unruptured fruit is sterile.

"2. The reaction of melons and tomatoes is strongly acid, and of cucumbers is mildly acid, at all stages of ripening.

"3. The temperature of these fruits is lower than that of the external atmosphere by :—

13·89° F. (7·7° C.)	in the case of	the	melon.
15·98° F. (8·8° C.)	,,	,,	cucumber.
6·01° F. (3·34° C.)	,,	,,	tomato.

"4. The cholera vibrio can be recovered from melons seven days, and from cucumbers and tomatoes three days, after they have been inoculated."

J. H. Tull Walsh.

SANARELLI (G.). **De la pathogénie du choléra (sixième mémoire) ; le "choléra intestinal" des jeunes chiens.**—*Ann. Inst. Pasteur.* 1922. May. Vol. 36. No. 5. pp. 386–398.

——. **Patogenesi del colera (VIa Memoria). Il "colera intestinale" nei giovani cani.**—*Ann. d'Igiene.* 1922. May. Vol. 32. No. 5. pp. 349–361.

[For previous memoirs see references, this *Bulletin*, Vol. 17, p. 401.]

The experiments described in this memoir refer to the action on *V. cholerae* of the blood-serum, the gastric juice and the succus entericus of puppies. The action of the serum of the adult dog is always vibriocidal and that without regard to age or race. If 1 cc. of serum is added to a suspension of vibrios in physiological salt solution, the vibrios are killed at the end of one or two hours. On the other hand the serum of newly born puppies has, like that of newly born rabbits, no bactericidal power. Nevertheless the vibriocidal property of the serum shows itself sooner in young dogs than in young rabbits. The gastric juice of puppies prevents the onward passage of living vibrios. The succus entericus collected from a loop of intestines is not a favourable culture medium for *V. cholerae.*

J. H. T. W.

MASAKI (S.). **Du mécanisme de l'infection cholérique et de la vaccination contre le choléra par la voie buccale.**—*Ann. Inst. Pasteur.* 1922. May. Vol. 36. No. 5. pp. 399–415.

The author has repeated the work of BESREDKA, SANARELLI, and others—using guinea-pigs and rabbits for his experiments. His conclusions are :—

1. Vibrios injected into veins, into the peritoneal cavity, or even subcutaneously, are mostly recovered in the intestines.

2. The rabbit and guinea-pig are refractory to any dose of vibrios given by the mouth.

3. Bile given by the mouth increases the action of the cholera endotoxin in the intestines [and, apparently, inhibits the action of the gastric juice].

4. Ingestion of living or dead vibros is not followed by the appearance of antibodies.

5. The rabbit alone, sensitized with bile, reacts to vibrios given by the mouth.

6. Only the sensitized animal, after pathological troubles set up by the ingested vibrios, becomes "vaccinated" against a dose which would otherwise be fatal.

7. The immunity acquired is probably local in the intestine.

J. H. T. W.

BAUMGARTEN (W.). **Die intraperitoneale Cholerainfektion und der Pfeiffersche Versuch bei der Maus.** [Intraperitoneal Cholera Infection and the Pfeiffer Test in Mice.]—*Ztschr. f. Hyg. u. Infektionskr.* 1921. Vol. 93. No. 1. pp. 87–95.

A long paper of experiments on mice. The results show that serum does not protect and that complement is less marked in mice than in guinea-pigs. The work of SANARELLI and others makes it unnecessary to comment at length on these experiments.

J. H. T. W.

PLATZ (Camilla). **Zur Frage der Veränderlichkeit von Vibrionen.** [The Variability of Vibrios.]—*Ztschr. f. Hyg. u. Infektionskr.* 1922. Vol. 95. No. 3. pp. 365–369.

This is a critical paper dealing with the transformations of vibrios as observed and reported by KUHN (Ph.). The cultured strains are placed direct with the agar on the cover-glass and after removal of the agar are stained with "Giemsa." By this method KUHN observed certain morphological changes. For the first hour typical "commas" are seen; then threadlike forms appear which increase and form a network. These KUHN called B-(bacteria)forms. After a time granules appear in the B-forms which are not stained red by Giemsa in fresh preparations. Other forms seen by KUHN were: D-(dendritic), A-(amoeboid) and C-(coccoid). Platz has found involution forms also. [These forms of the cholera vibrio have been long known. In Calcutta D. D. CUNNINGHAM found that they differed with the culture medium.]

J. H. T. W.

KODAMA (Toyojiro). [**Contribution to the Knowledge of the New Specific Medium for** *V. cholerae*, **together with a Critical Review of Aronson's Medium.**]—*Eiseigaku Densembyogaku Zasshi* (*Jl. of Hyg. & Infect. Dis.*). 1922. Feb. Vol. 17. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1922. June 5. Vol. 2. No. 6. p. 176.]

[Refers to previous work, for which see this *Bulletin*, Vol. 19, p 381.]

This report deals with an improved method of preparing medium No. 3:—

A. solution:	3 per cent. litmus neutral agar (with Witte's peptone) ..	100·0
	10 per cent. sodium bicarbonate solution	1·0
	Fuchsin saturated alcoholic solution	0·5
	Fresh 10 per cent. sodium sulphite solution	2·5

To the above is added 3·0 gm. Merck's soluble starch and the whole then boiled in the steam kettle for 20–30 minutes.

B. solution:	1/5 diluted bovine serum ..	100·0
	10 per cent. caustic soda ..	1·0

This solution is also boiled in the steam kettle. For use 2 parts of A. and 1 part of B. are mixed, sterilized for three days and used as a plate medium.

J. H. T. W.

i. KABESHIMA (Tamezo). [**On Para-Agglutination of the Cholera Immunized Rabbit's Serum.**]—*Nihon Biseibutsugakkai Zasshi* (*Jl. of Japan Microbiol. Soc.*). 1922. Jan. Vol. 16. No. 2. [Summarized in *Japan Med. World.* Tokyo. 1922. June 15. Vol. 2. No. 6. p. 173.]

ii. ——. [**Choice of the Immunological Reaction in the Diagnosis of** *Vibrio cholerae*.]—*Ibid.* [Summarized in *Japan Med. World.* Tokyo. 1922. June 15. Vol. 2. No. 6. p. 173.]

i. The author observed that a strain of *V. cholerae* isolated from several cases on H.I.M. Ship *Nissin* had developed two kinds of colonies, one thin and the other thick. By the use of the serum of the rabbit immunized with both strains, which was of high titre, they agglutinated. One was a true type *V. cholerae*, the other a paracholera vibrio.

ii. As in former epidemics in Japanese territory, the vibrios found in the epidemic of 1919–1920 contained more than one strain, and the author states that diagnosis must be made with sera suited to each strain.

J. H. T. W.

COHENDRY & WOLLMANN (E.). **Quelques résultats acquis par la méthode des élevages aseptiques: I. Scorbut expérimental. II. Infection cholérique du cobaye aseptique.**—*C.R. Acad. Sci.* 1922. Apr. 18. Vol. 174. No. 16. pp. 1082–1084.

This section deals only with Part II of this paper. The authors state that young guinea-pigs, which are aseptic as to the alimentary

canal or contaminated by one germ only, viz., *Staphylococcus B-mesentericus*, when fed (at the age of 10 to 15 days) with one or two cultures of *V. cholerae*, show at the time of death (six to nine days after ingestion): a more or less hyperaemic intestine; caecum filled with fluid; and a pure culture of the vibrio, both from the gut and the blood. It is quite different with the controls, which are not aseptic, but fed with sterilized food. In their case the ingested vibrios disappear in 48 hours, or even in 24 hours, so that no cultures can be obtained. Is the difference due to the presence of, and the antagonism of, the usual intestinal flora in the controls? METCHNIKOFF believed that such was the case. Or, as SANARELLI thinks, does the presence of this flora render the intestinal mucous membrane more impermeable?

J. H. T. W.

ODA (Shumro). [**On the Biological Studies of *Vibrio cholerae* isolated from Cases in Cholera Epidemic that prevailed in China, Formosa, Korea and Japan in 1919, in Special Reference to the Types of Cholera Vibrios.**]—*Jikken Igaku Zasshi* (*Jl. of Experim. Med.*). 1921. Oct. Vol. 5. No. 4. [Summarized in *Japan Med. World.* Tokyo. 1922. Mar. 15. Vol. 2. No. 3. pp. 81–82.]

Certain strains developed a haemotoxin [as already recorded, see this *Bulletin*, Vol. 17, p. 406, WATANABE, etc.; also Vol. 18, p. 353, DOUGLAS (S. R.)]; otherwise they agreed with other vibrios isolated by the author.

J. H. T. W.

KAMIMURA (Yukiaki) & TSUDA (Katsusuke). [**On the Incubation Period of Cholera.**]—*Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*). 1921. Oct. Vol. 20. No. 10. [Summarized in *Japan Med. World.* Tokyo. 1922. Mar. 15. Vol. 2. No. 3. p. 79.]

During an epidemic in 1920 the authors noticed that the incubation period was very short, especially among women and children. In most cases the period [not always easy to fix] was three days. The shortest incubation period was five hours, the longest 11 days.

J. H. T. W.

MUTERMILCH (S.). **L'épidémie du choléra dans l'armée polonaise en 1920–1921.**—*Ann. Inst. Pasteur.* 1922. Apr. Vol. 36. No. 4. pp. 287–304. With 1 map in text.

The infection was introduced from Russia by the Red Army. There were 877 cases:—

Prisoners of war	835
Polish soldiers	42

with 490 deaths. Among the civil population there were 114 cases with 57 deaths. The epidemic did not show anything new. The anti-cholera vaccine used in the Polish army contains also *B. typhosus*, *B. paratyphosus* A and B.

J. H. T. W.

SEALY (G. O. F.). **The Treatment of Early Cases of Cholera with Volatile Oils.** [Correspondence.]—*Brit. Med. Jl.* 1922. June 10. pp. 918–919.

Employing 40 minim doses of a mixture containing 12 or 15 minims of the oils of cajeput, aniseed and juniper, together with tincture of cinnamon, alcohol, ether and sulphuric acid, the author has successfully treated several cases of cholera, two in Baghdad and nine in the Indian Station Hospital, Ferozepore.

J. H. T. W.

CHATTERJEE (Lal Mohan). **Statistics of the Treatment of Cholera Cases by a Modified Method of Sir Leonard Rogers, as carried on at the Mayo Hospital.** —*Indian Med. Gaz.* 1922. Jan. Vol. 57. No. 1. p. 10.

The modification referred to consisted in giving an alkaline injection (Soda bicarb. ʒij, Water Oj) before using intravenous injections of hypertonic salt solution. Between March and June, 1921, 97 cases were thus treated; 77 recovered and 20 died.

J. H. T. W.

OHKURA (Tatsuwo). [**On the Respiration of Cholera Patients under the Influence of Sodium-Bicarbonate Saline Solution which has been injected into the Vein.**]—*Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*). 1921. Oct. Vol. 20. No. 10. [Summarized in *Japan Med. World.* Tokyo. 1922. Mar. 15. Vol. 2. No. 3. p. 79.]

The author records that the beneficial effect of the saline injections was seen in the improvement of respiration and pulse.

J. H. T. W.

YASUTOMI (Yoshihiro). [**On the Duration of Immunity in Cholera Vaccination.**]—*Namman Igakkwai Zasshi* (*Jl. S. Manchuria Med. Soc.*). 1921. Dec. Vol. 10. No. 1. [Summarized in *Japan Med. World.* Tokyo. 1922. Apr. 15. Vol. 2. No. 4. p. 117.]

The author has proved by experiments [whether on animals or man during an epidemic is not stated] that the immunity produced by anti-cholera vaccination lasts for over a year and is as powerful as immunity due to an attack of cholera. [This, if confirmed, is of interest and value.]

J. H. T. W.

ORNSTEIN (Otto). **Ueber die Rolle der Tropine und Antitoxine bei der experimentellen Choleraimmunität.** —*Ztschr. f. Hyg. u. Infektionskr.* 1922. Vol. 96. No. 1. pp. 70–91.

Starting with the work originally done by PFEIFFER, the author reviews the nature and effects of the cholera poison. He refers to the haemolysing power of "El Tor" and other strains. Part II consists of a résumé of immunity produced by oral feeding, and a long table of experiments on guinea-pigs is given [*cf.* this *Bulletin*, MASAKI, Vol. 19, p. 383].

J. H. T. W.

i. DELAMARE (Gabriel). **Étude sur quelques cas de choléra observés à Constantinople en 1912-1913.**—*Bull. de l'Administration sanitaire des Frontières.* Constantinople. 1922. Feb. 20. No. 10. pp. 183–189; Mar. 5. No. 11. pp. 203–213.

ii. TSEN (Edgar T. H.). **The Bacteriological Diagnosis of Cholera.**—*Nat. Med. Jl. China.* 1922. Mar. Vol. 8. No. 1. pp. 22–34.

iii. DE PARTEARROYO (Francisco R.). **Un medio de cultivo para la diferenciación de los vibriones coléricos y seudocoléricos.** [A Culture Method for Differentiating *V. cholerae* from Pseudo-cholera Vibrios.]—*Arch. del Inst. Nac. de Hig. de Alfonso XIII.* 1922. Mar. Vol. 1. No. 1. p. 25.

iv. CRENDIROPOULO (Milton). **La question du paracholéra.**—*Bull. de l'Administration sanitaire des Frontières.* 1922. June 5 & 20. Nos. 17 & 18. pp. 353–356; 375–377.

v. SPRAWSON (C. A.), with Pathological Account by MUKHERJI (J. G.). **A Choleroid Epidemic in the United Provinces.**—*Indian Med. Gaz.* 1922. Jan. Vol. 57. No. 1. pp. 2–5. With 4 charts in text.

i. A detailed description of 100 cases of cholera.

ii. A paper read before the Fourth Biennial Conference of the National Medical Association of China, at Shanghai, February, 1922. Gives the usual methods employed in bacteriological diagnosis.

iii. A short paper referring to GORDON's method of distinguishing true cholera vibrios from so-called pseudo-cholera vibrios by estimating the amount of acid produced in a culture medium containing soluble starch.

iv. The author examines the literature of paracholera vibrios [see this *Bulletin*, Vol. 16, p. 37 (GREIG); p. 437 (JORGE)].

v. This epidemic, although presenting symptoms of a mild form of cholera, was apparently due to an organism allied to *B. paratyphosus* B. The bacteriological work leading to this conclusion is given in detail.

J. H. T. W.

BESREDKA. **De la vaccination contre le choléra.**—*La Médecine.* 1921. Dec. Vol. 3. No. 3. pp. 180–185.

GARAVAGLIA (Agostino). **Sulla vaccinazione per via boccale contro il tifo, il colera e la dissenteria.**—*Policlinico.* Sez. Prat. 1922. Oct. 2. Vol. 29. No. 40. pp. 1296–1297.

KODAMA (H.) **Ein neuer elektiver Nährboden für Choleravibrionen.** *Cent. f. Bakt.* 1. Abt. Orig. 1922. Aug. 8. Vol. 88. No. 6. pp. 433–435.

MIYAKE (Moriji). [**A Contribution to the Biological Studies of the Agglutinogen of Cholera Vibrio.**]—*Osaka Igakkwai Zasshi (Jl. of Osaka Med. Soc.).* 1921. Oct. Vol. 20. No. 10. [Summarized in *Japan Med. World.* Tokyo. 1922. Mar. 15. Vol. 2. No. 3. p. 79.]

NEGRONI (Pietro). **Sul valore dell' agglutinazione nella profilassi del colera.**—*Boll. d. Istituto Siero-terapico Milanese.* 1917. Nov. Vol. 1. No. 2. pp. 75–84. [Received Oct. 16, 1922.]

NEVEU LEMAIRE. **Les grandes endémo-epidémies inter-coloniales. Le choléra.** *Presse Méd.* 1922. June 28. Vol. 30. No. 51. pp. 1061–1067. With 1 map in text.

UNDULANT FEVER.

NICOLLE (Charles) & CONSEIL (E.). **Vaccinations préventives par voie digestive chez l'homme dans la dysenterie bacillaire et la fièvre méditerranéenne.**—*Ann. Inst. Pasteur.* 1922. Aug. Vol. 36. No. 8. pp. 579–613. With 4 charts.

After discussing the value of prophylactic inoculation in general, and the recent method of BESREDKA for the immunization against typhoid by the ingestion of the vaccine, the authors point out how important it is to carry out the experiments on animals which can contract the disease and show symptoms more or less similar to those of man; also that no animal experiments are of such value as human.

They selected for trial two very dissimilar organisms—*B. dysenteriae* Shiga and *M. melitensis*, the former exerting its influence chiefly locally on the intestinal mucous membrane, the latter causing a septicaemia of long duration.

For the undulant fever tests they had a group of three men, natives of Tunisia, whose blood showed no agglutination reaction. Two of these were immunized by subcutaneous injections (two at seven-day intervals) of a vaccine made from five strains of *M. melitensis*; 14 days later all three were inoculated with a living culture; the two former suffered no ill effects, the control developed fever on the eighteenth day. This showed the protective value of the subcutaneous inoculations. A second experiment was carried out on three other men with the same strains. Two were given 100 milliards of the vaccine by the mouth on three consecutive days and again on the fifteenth day; neither digestive nor general symptoms followed; 15 days after the last dose they showed no agglutination reactions. They, with the control, were then inoculated with the living emulsion subcutaneously. The two vaccinated men were again immune, but the control developed the fever on the seventeenth day and from his blood the organism was recovered, after which he was cured with anti-melitensis vaccine, as was also the previous control. The blood of the immunized men in both series never showed any agglutinative power with any of the strains used. [This is a curious fact! How was it that the men inoculated with dead vaccine and again with living culture developed immunity and still had no agglutinins in the blood?]

The same satisfactory evidence of the advantage and efficiency of the alimentary method for immunization was obtained with *B. dysenteriae* Shiga.

P. W. Bassett-Smith.

BURNET (Et.). **Recherches sur la fièvre méditerranéenne.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. June. Vol. 2. No. 2. pp. 165–211. With 1 plate & 1 chart.

This is the first report of research at Tunis on undulant fever by the author, where opportunities for the study of this disease in man and animals are very favourable; and the author has given an extremely valuable record of his many interesting experiments and observations. It is divided into three parts: (1) on the infection in guinea-pigs; (2) in rabbits; (3) on the intradermal method for diagnosis; this with many of the other data has been already reported [this *Bulletin*, Vol. 19, p. 854]. His observations show that guinea-pigs and rabbits are easily infected with *M. melitensis*, but no fever analogous to that seen in man and monkeys is produced; the organism

is rapidly eliminated from the blood but is found intermittently in the milk and urine; it tends to produce a chronic infection and is constantly found in the lymph glands, spleen and bone marrow; there is a great tendency to production of local abscesses from which the specific organism can practically always be isolated, and in the organs pseudo-tubercles are seen. Infection is rare in the new-born, and the young are rarely infected by the milk; they appear to have some hereditary immunity.

In 1915 the number of positive laboratory results in man began to go up, and the percentage of infected goats, which was 4·02 in 1909, rose in 1922 to 9·1, the Maltese goats in 1922 being the least instead of the most frequently affected. In infected goats the bacteriological and serological results varied very much from time to time, and it would seem, as stated by ZAMMIT, that an infected goat never recovers. The author emphasizes the fact that we know very little about the disease in goats, and that it is important to obtain information as soon as possible.

The paper should be read *in extenso* by all interested in the subject, and some reference to *M. paramelitensis* and *B. abortus* will be looked forward to at a future date, particularly with regard to the pyogenic effects of the different organisms.

P. W. B-S.

ROZIÈS (H.). **La fièvre de Malte dans le Haut Var.**—*Progrès Méd.* 1922. Mar. 25. No. 12. pp. 133–135.

In the Canton of Haut Var (S. E. France) goats abound and the milk is not boiled. It was therefore not a surprise to find undulant fever endemic; 12 cases were observed by the author. He notes especially, among the symptoms, sciatica without atrophy or loss of reflexes, enlargement of the liver and spleen, marked anaemia and asthenia. The duration of the fever is two to three months. He divides the cases into four groups: (1) hyperpyrexial (two cases); (2) ataxo-adynamic, mostly in the young; (3) haemorrhagic, with epistaxis, haematemesis, melaena, metrorrhagia, and purpura; (4) interminable. He states that 90 per cent. of the people drink goat's milk, and in 10 out of his 12 cases the milk used was not sterilized. The usual prophylactic measures were recommended. Quinine, camphor, pyramidon, methyl blue, collargol, and electrargol did not appear to shorten the disease. Vaccines are recommended but they must be used in large doses [amount not stated], gradually increasing every third day. [It is noticeable that in the 12 cases the symptoms were exceptionally severe and it is probable that there were milder cases which did not come under treatment.]

P. W. B-S.

ZAMMIT (T.). **Undulant Fever in the Goat in Malta.**—*Ann. Trop. Med. & Parasit.* 1922. Mar. 31. Vol. 16. No. 1. pp. 1–10. With 2 plates.

The incidence of melitensis infection in man at Malta since 1894 is commented upon. The beneficial results of the work of the Mediterranean Commission cannot be better described than in the author's words. "Before 1904 few of the employees of the Electric Telegraph Company, the dockyard, etc., or their families, escaped infection; but it is now an exception for a foreign resident, who takes the necessary precautions, to fall a victim to undulant fever. The bulk of the Maltese population, who thought that they knew

better, have not heeded the caution repeatedly given out by the Sanitary Office as to the danger of using unboiled milk, with the result that there has been hardly any decrease in the number of cases of undulant fever." With regard to the goats, a table of infection from 1907 onwards shows that the average rate is 5 per cent., a dangerous proportion, as a single goat may infect hundreds of persons. The attempt to limit the disease by educating the people has been a failure, so that *the only prophylactic measure applicable is the destruction of all infected animals.* The immunization of the goats themselves by the method claimed by VINCENT (this *Bulletin*, Vol. 12, p. 378) as successful has not been effective in Malta. VINCENT's statement that "an infected goat recovers spontaneously after a period of time more or less long" is contrary to the writer's very long experience: he states that he has never known an infected goat to recover, the organism being always found on post-mortem examination in some of the organs. After kidding, a goat which has been infected but may appear to be perfectly healthy yields a milk teeming with melitensis.

No mention is made as to the presence of *B. abortus* in goats at Malta.]

P. W. B-S.

STEPHENS (J. W. W.). **Undulant Fever in the Naval, Military and Civilian Populations of Malta.**—*Ann. Trop. Med. & Parasit.* 1922. Mar. 31. Vol. 16. No. 1. pp. 11–20. With 3 charts.

This paper is supplementary to that of ZAMMIT. Tables and charts are given showing the incidence of undulant fever in the naval squadron, the military garrison at Malta, and the civil population, from 1902

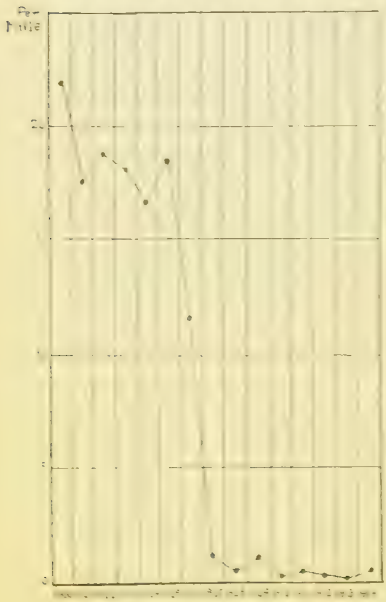


CHART I. Showing incidence of Undulant Fever in the Mediterranean Squadron. N.B.—One division of this scale represents 5 per 1,000.

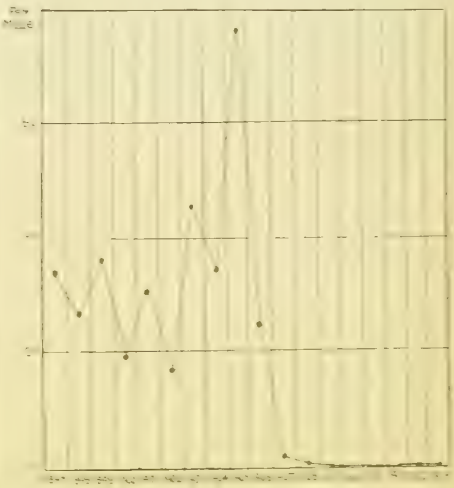


CHART II. Showing incidence of Undulant Fever in the Malta Garrison. N.B.—One division of this scale represents 20 per 1,000.

to 1919. In the services the fall was rapid and almost complete in 1906–7 after the infected milk was prohibited or boiled, whereas the incidence in the civil population remains about the same.

P. W. B-S.

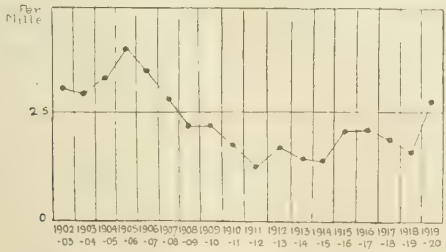


CHART III. Showing incidence of Undulant Fever in the Civil Population of Malta. N.B. — One division of this scale represents 2·5 per 1000.

[Reproduced from the *Annals of Tropical Medicine and Parasitology*.]

BANCE (J. E.). **Des modifications apportées par la fièvre méditerranéenne à la composition chimique du lait de chèvre.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. June. Vol. 2. No. 2. pp. 212–218.

In this investigation the goats whose milk was examined were divided into four groups: (1) healthy; (2) infected, but still good milkers; (3) infected, but only moderate milkers; (4) infected, and giving very little milk. The control bacteriological examinations were made by BURNET. The composition of the normal goat's milk was found to be a little different from that given by other authors, having a sp. gr. of 1028 30, casein 30 gm., lactose 50 gm. per litre, though less in the dry season, and ash 6·5–7·5. In the milk of the infected goats the most notable feature was the increase of the albuminous factor, proportionate with the presence of leucocytes. The sp. gr. rose from 1029–30 to 1033–35. The lactose varied very little, except when there was acute mastitis. Thus an infected goat, still a good milker, gives milk of a higher sp. gr. and higher albumen content; as the milk gets less in quantity the density and ash increase. When the udder is infected and hard the leucocytes increase in number lactose is diminished, casein and ash are high. Inoculation with specific vaccine appeared to have no influence on lactation, either in healthy or diseased goats, but the experiments were too few to admit of absolute conclusions and they will be continued.

P. W. B-S.

BÉGUET (M.). **Existence simultanée de l'infection mélitensique chez l'homme et chez les chèvres dans un village.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Mar. Vol. 2. No. 1. p. 71.

Three cases of undulant fever occurred in a village of 1,200 inhabitants in Algeria. Investigation showed that out of 92 goats in the locality two which furnished milk for the sick were infected with *M. melitensis.*

P. W. B-S.

MARAIS (David P.). **Undulant (Malta) Fever in South Africa. An Appeal for its Study and for the Recognition of its Chronic Forms.** —*S. African Med. Rec.* 1922. Aug. 26. Vol. 20. No. 16. pp. 313–314.

The author is convinced that undulant fever in a chronic or latent form is endemic in the Union of South Africa, and that many of the cases pass unrecognized. He therefore appeals to medical men to give more care to the study of the disease, so that measures may be put in force both to prevent its spread and to study further its local etiology.

P. W. B-S.

COURCOUX (A.), LELONG (Marcel) & CORDEY. **Note sur un cas parisien de mélitococcie.** —*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. July 27. 38th Year. 3rd Ser. No. 25. pp. 1104–1110. With 2 charts.

The authors describe the case of a man suffering from a prolonged irregular type of fever, which lasted seven months. By a process of exclusion, and finally by positive serum and blood culture tests, this was proved to be undulant fever, due to an infection from handling goat skins in his daily work. The chief points of interest were the source of infection in a non-endemic area; the duration of the fever with the irregularity of the length of the waves of pyrexia, of which the shortest (the third) was four days, the longest and the last recorded 34 days (possibly not the last of the case); the severe lumbar pains early in the disease; the sweats and polyuria; the anaemia with low polynuclear count; and the marked emaciation.

An auto-vaccine was made and three injections were given of 150–500 million, but neither did these give rise to any local or general reaction, nor did they appear to improve the condition.

[These cases reported from regions far from the Mediterranean are very interesting and indicate the importance of excluding this disease in all cases of prolonged fever with a wavy temperature, associated with sweats, constipation, and emaciation—cases often bearing a strong resemblance to early tuberculosis. The vaccine treatment was not given a sufficient trial to admit definite conclusions as to its efficacy.]

P. W. B-S.

FIESSINGER (Noël) & BLUM (Gaston). **Fièvre de Malte à forme ambulatoire traitée par la vaccinothérapie.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. July 13. 38th Year. 3rd Ser. No. 24. pp. 1040–1045. With 1 chart in text.

The authors describe a case of slight but prolonged fever contracted in the south of France, with short but fairly regular undulations of pyrexia, attended with marked headache, anorexia, articular pains, sweats, enlarged spleen, and lassitude, during which, however, the patient carried on his usual work. On April 12, 1922, his serum gave a positive agglutination with *M. melitensis* to 1/200. On April 13 and 18 he was treated with a vaccine (from the Pasteur Institute); on April 20 the sero-agglutination had risen to 1/2000. The peculiar features of the case were the short periods of pyrexia (about three days), their regularity and complete intermission, and the curious fact that at each slight relapse after the vaccine had been given there was a painful reaction at the site of injection, analogous to the cutaneous reaction with filtered cultures described by BURNET.

In the discussion which followed the paper, M. HALBRON mentioned a case of four months' duration, in which a vaccine from the Pasteur

Institute and an autogenous vaccine had been given, but no local reaction as described above had been seen, though an injection given during a slight relapse was followed by a rather violent reaction with collapse, after which the fever ceased entirely, as if the disease had been arrested by a " shock " phenomenon.

[In the reviewer's experience of hundreds of cases treated with vaccine he has never seen the cutaneous reaction described.]

P. W. B-S.

ALFRED-COURY. **La vaccinothérapie dans la fièvre de Malte.** —*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. July 6. Year 38. 3rd Ser. No. 23. pp. 998–1001.

In spite of the favourable results obtained by English and other clinicians the author concludes that vaccine therapy for undulant fever is more likely to do harm than good, provoking chronic cardio-vascular changes or relapses of the fever. He divides cases treated into three groups: (1) favourable, in which the curative action of the vaccine is open to doubt, the disease itself running such an irregular course; (2) ineffective, comprising a large number of the cases; (3) actually dangerous. He quotes a single case treated with Parke-Davis vaccine. In support of his contention he quotes a guarded statement by Sir Almroth WRIGHT, that though vaccine should be tried it ought to be given with great care.

[The use and dangers of melitensis vaccine are well known, but there is no justification for condemning altogether what at times is a very important remedy. The reviewer has always discouraged the use of vaccine alone in very acute conditions of the fever.]

P. W. B-S.

GERBASI (E.). **Osservazioni e ricerche sul comportamento biologico e morfologico del micrococco di Bruce e del paramelitense.**—*Pediatria.* 1922. Apr. 1. Vol. 30. No. 7. pp. 289–296.

In his observations the author refers to the *M. pseudomelitensis* of ZAMMIT and the *paramelitensis* of NICOLLE. On culture media there were no morphological points of distinction from *M. melitensis*, but he states that the paramelitensis coagulates milk and ferments sugar. The paramelitensis serum agglutinated the strains of melitensis with which it was tested, but not to so high a titre as the paramelitensis organism. When grown outside the body these characters are well marked, but the strain can be brought back to give the normal reactions.

[It is most probable that the coagulation of milk was due to some contamination of the culture, as neither the reviewer's strains nor any other described do this.]

P. W. B-S.

BURNET (Et.). **Sur un type d'arthrite fréquemment observé chez les cobayes infectés par le** *Micrococcus melitensis.*—*C. R. Acad. Sci.* 1922. Apr. 3. Vol. 174. No. 14. pp. 973–975.

The experiments were made on guinea-pigs, which the author considers are satisfactory animals for the study of the disease. Of 100 guinea-pigs injected subcutaneously with *M. melitensis* 20 developed arthritis in 12 weeks, affecting the knees, wrists, and costo-chondral joints. Radiography showed true arthritis with rarification and decalcifiation of the bones. Pathologically there was osteomyelitis and inflammation of the soft parts round. The presence of *M. melitensis* was easily demonstrated; out of 12 tests 10 were positive.

Of 75 control animals, 2 had similar arthritis and their blood gave positive agglutinin reactions with the *M. melitensis* at 1/80 and 1/400. It is stated that these had been infected by indirect contagion. This high percentage of arthritis in animals is believed to explain the frequency of the complication in man. In infected guinea-pigs the organism is always present in the marrow of the long bones, and it is there that it should be looked for in man and goats when it is absent from the blood and milk.

P. W. B-S.

JAFFÉ (R. Hermann). **Ueber die experimentelle Infektion des Meerschweinchens mit dem** *Bac. melitensis* **(Bruce) und dem** *Bac. abortus* **(Bang).** [Experimental Infection of Guinea-pigs with *B. melitensis* and *B. abortus*.]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1922. Apr. 22. Vol. 238. No. 1. pp. 119–134. With 8 text figs.

The author first states that heavy doses or cultures of exalted virulence can produce severe or fatal infection in guinea-pigs, rats, and mice, and that after intraspinal or intravenous inoculations rabbits show emaciation, cramps, and haemorrhages, with perivascular infiltration of the central nervous system and degeneration of the cells. Though guinea-pigs are comparatively resistant, they may be spontaneously infected, for in two animals received from Malta, which had lived in goat houses, the serum gave positive agglutinations and the specific organism was cultivated from their organs. Other guinea-pigs inoculated with medium doses of this strain rapidly developed symptoms and died of coma, the males showing testicular changes. With small doses the animals lived 100–200 days.

B. abortus caused abortion in guinea-pigs and gave rise to definite symptoms with a mortality of 8 to 20 per cent. Histologically there was enlargement of the spleen in 98 per cent. and generally of the lymph glands and testicles.

The most important histological change in both is the formation of nodules in the liver, spleen, and other organs, made up of endothelial cells with oval nuclei deficient in chromatin, and giant cells. SCHROEDER produced similar changes in guinea-pigs by injecting raw cow's milk [was this tubercular?]. In the author's experiments the tendency to testicular implication was most definite with both the organisms and in very chronic cases these only were found. The large "clear cells" were first recognized in the infected testicles after six to eight weeks, mostly in the interstitial tissue, but they were seen to be passing into the tubules; they are phagocytic and are very characteristic, differing from those in tuberculosis in being less compact and less intensely coloured, and the nuclei are more separated. In the nodule they break down but there is no real necrosis of tissue. In abortus infection abscess formation is common, destruction of testicular tissue is slight, and is followed by recovery, whereas in melitensis infections the damage is more generally parenchymatous, without abscess formation, but the organ never recovers. Animals infected with *M. melitensis* showed fewer and smaller nodules than those infected with abortus; the qualitative changes are the same; these specific granulations are most abundant in the testicles, but are present and vary more in other organs and in the lymph glands. Subcutaneous, intraperitoneal, intravenous, intratesticular and intraovarian injections were given to the animals; the results were very similar but varied in degree; the diffusion of

the nodular growths was very widespread and most marked in the abortus infections.

The author concludes that though these endothelial and lymphoid growths are common in guinea-pigs, proof is required that they are also present in man, though somewhat similar changes have been described in the spleen by various observers. Plates are given showing the types of giant cells seen in melitensis and abortus infections, with sections of the various tissues affected.

[In *Jl. Trop. Med. & Hyg.*, March, 1921, the reviewer described a large abscess formation in the testicle of a rabbit inoculated intravenously with *M. paramelitensis* which did not occur in the animals inoculated with *M. melitensis*.]

P. W. B-S.

MEYER (K. F.), SHAW (E. B.) & FLEISCHNER (E. C.). **The Pathogenicity of *B. melitensis* and *B. abortus* for Guinea-Pigs. Studies on the Genus *Brucella* nov. gen. IV.**—*Jl. Infect. Dis.* 1922. Aug. Vol. 31. No. 2. pp. 159–197.

After an extensive series of over 1,000 experiments on guinea-pigs, carried out during the last six months, the authors conclude that the inoculation of *M. melitensis* is able to produce in guinea-pigs lesions indistinguishable from those caused by *B. abortus*, cross-agglutination reactions separating the two diseases. They also demonstrate that the virulence of various strains of melitensis is very variable. Only four out of 22 strains were highly pathogenic. These were (11) English, 1896; (21) Bassett-Smith, 1904; (26) Eyre, 1915, and (27) Eyre from goat's milk; six other strains gave rise to occasional lesions. In each series six or more animals were tested with each strain, and often several series were made, with efficient controls. Not only did the cultures thus vary enormously, but the resistance of some guinea-pigs was very remarkable; certain sets from some vendors appeared practically immune, which, with the reported instances of naturally contracted disease in guinea-pigs, points to a local immunity, natural or acquired. The disease ran a rapid and fatal course in 42 per cent. of the infected guinea-pigs; in 58 per cent. it was subacute or chronic. Only 76 of the 143 animals infected in this last set of experiments with the 10 different pathogenic strains yielded evidence which could be considered indicative of infection by positive skin tests, macro- or microscopical lesions, or by positive cultures; therefore, to known toxic strains a large percentage of animals was insusceptible. This irregularity is stated not to be due to the age of the culture, though it is generally believed that the more recently isolated the organism the more likely is it to infect.

The pathological lesions seen in the spleen and lymphnodes of melitensis-infected guinea-pigs appear to be less striking than those found with abortus infections. The sexotropism following any form of inoculation of *B. abortus* is remarkably constant; melitensis in man and goats also appears to show a marked predilection for the sex organs. Old laboratory cultures of *B. abortus* produce lesions often not seen with the naked eye, and this group resembles closely those caused by the intratesticular or intraperitoneal injection of certain strains of *M. melitensis*. It is important to note that the course of infection produced by the two organisms in guinea-pigs is the reverse of that seen in monkeys, when the melitensis is the more invasive. The question whether abortus can be transformed into

TABLE 4.

Summary of Experiments with Strains of B. melitensis.

Strains.	Number of Guinea-Pigs Inoculated.	Number of Infections.	Course of Infection.		Anatomic Lesions.						Cultures.	Serum Reactions.
			Acute and Fatal.	Subacute and Chronic.	Lymph-nodes.	Spleen.	Liver.	Lung.	Testis Abscesses.	Bones.		
1, 2, 3, 4, 5, 7, 8, 9, 10, 23, 24 and 25 ..	60	0	—	—	—	—	—	—	—	—	—	—
2, 3, 4, 5 and 11 ..	41	21	7	14 (44–155)	12	14	9	1	3	—	21	14
6 (Algiers, human ?)	6	2	2	—	2	2	2	—	—	—	2	+2
11 (English, human, 1896) ..	31	11	6	5	4	2	1	0	1	0	11	+4
18 (England, human, 1915) ..	7	6	4	2	1	2	0	0	1	0	6	+2
19 (England, goat) ..	8	3	2	1	0	0	0	0	1	0	3	1
20 (Austria, human ?)	8	1	1	—	—	—	—	—	—	—	1	—
21 (England, human, 1904) ..	13	9	2	7	5	5	0	1	2	4	9	7
22 (Para-melitensis)	7	5	4	1	1	—	1	—	1	—	5	1
26 (England, human, 1918) ..	9	9	2	7	2	4	2	—	4	1	9	5
27 (England, goat, 1917)	8	8	2	6	6	6	1	0	(2)	0	8	4
29 (Sicily, human ?)	5	1	0	1	1	0	0	0	1	1	1	—
Total ..	203	76	32	44	34	35	16	2	14 (2)	6	76	40

melitensis cannot be answered yet; animals immunized with progressive doses of melitensis and abortus, and then inoculated with full doses of *B. abortus* 80, were no more protected than the control animals. The small percentage of positive results with the inoculation of known virulent and otherwise apparently normal strains of *M. melitensis* would suggest that experiments should be carried out on animals which are more susceptible, rabbits or monkeys, if practicable. The septicaemic character of the infection with the paramelitensis strain (B-S. from Nicolle) confirms the results obtained

at Greenwich, and explains the severe effects seen in some human infections by this organism.

[This fourth study provides much food for thought and is a model of investigation work, but we do not know yet the exact relationship of *B. abortus* and *melitensis*, nor whether the disease in goats is the same as that of cattle suffering from abortus infection. This is the crux! It is a fact also to be remembered that abortus disease in animals is very common in most temperate climates, while melitensis infection is very rare.]

P. W. B-S.

SKARIČ (J.). **Ueber die Beziehungen des** *Bac. melitensis* (**Bruce**) **zum** *Bac. abortus infect. bovum* (**Bang**). [On the Relationship of *B. melitensis* (Bruce) and *B. abortus* (Bang).]—*Ztschr. f. Hyg. u. Infektionskr.* 1922. Vol. 95. No. 3. pp. 358–364.

In this research four strains of melitensis from Kral laboratory and eight of abortus were used. The author found that in early recently-isolated cultures of melitensis from animals the coccus character was common whereas in old cultures the short bacillary form staining somewhat irregularly was predominant. He states that the two organisms cannot, without practice, be distinguished. In culture media only slight differences were noted; in broth the deposit of abortus at the bottom of the tube was more abundant (quicker growth); the colour changes on agar were not constant, and were not quite in agreement with those of MEYER and SHAW. Agglutination and absorption work gave little fresh evidence. The melitensis serum agglutinated the melitensis organism to a higher titre than abortus; while abortus serum agglutinated the abortus organism to a very high titre (100–50 per cent.) and gave with melitensis only 6–12 per cent. Melitensis serum which had been absorbed with *B. abortus* completely lost all agglutinating power for other strains of abortus, while melitensis serum was only completely absorbed by the homologous strain. These results point to the conclusion that the agglutinins of melitensis and abortus are not of a simple nature, but a complex; one part is common to both, while the other is apparently specific but varying in quantity. Acid agglutination, complementary fixation, precipitation, and bacteriolytic research gave no further differentiation. The relationship between the two forms is therefore very close; the slight differences in immunity reactions are not greater than between different strains of the same organism.

The question of pathogenicity of abortus to man is not clear. In parts of Austria epidemic abortus disease in cattle is very common, yet there is no undulant fever. Skaric asks, may it not be necessary for the organism to pass through goats to become pathogenic to man? As the milk infected with abortus also carries immune bodies, may these not also protect humans, as suggested by KHALED (see this *Bulletin*, Vol. 19, p. 351)? But this should not make us overlook the possible danger of such infected milk, particularly for infants and sick people.

[Incidentally this emphasizes the importance of sterilizing all milk before use.]

P. W. B-S.

BLANC (Georges). **Une nouvelle méthode de laboratoire pour le diagnostic de la fièvre Méditerranéenne. La réaction de Burnet.** *Gazette Méd.* 1922. Mar.–Apr. Vol. 24. No. 3–4. p. 9.

SALVAT NAVARRO (Antonio). **Melitococcia o fiebre maltesa.** *Rev. Española de Med. Cirug.* Barcelona. 1922. Aug. Vol. 5. No. 50. pp. 433–439.

DENGUE AND PAPPATACI FEVERS.

RICE (Lee). **Dengue Fever: Preliminary Report of an Epidemic at Galveston.**—*Texas Jl. State Med.* 1922. Aug. Vol. 18. No. 4. pp. 217–218.

The last epidemic of dengue at Galveston was 25 years ago, when it attacked practically half the population. Since that time the disease has been endemic, with only one slight outburst in 1918. The present epidemic commenced near the end of June, 1922; at the end of that month there were over 500 cases, and the disease was spreading. In August the number of cases had passed 8,000, and it is feared that the infection will spread throughout Southern Texas. No prophylactic measures have been taken. The interesting fact is noted that early in June, Stegomyia mosquitoes were extraordinarily abundant, they swarmed into all unscreened houses, and it was impossible to avoid their bites; a week later the cases began to appear. There is no mention of any mortality.

P. W. Bassett-Smith.

GÄRTNER (W.). **Epidemiologische Untersuchungen ueber Pappatacifieber bei der Kaiserl. Marine in der Türkei.**—*Ztschr. f. Hyg. u. Infektionskr.* 1920–21. Vol. 91. No. 2. pp. 262–305. With 4 text figs.

After a short historical sketch of the disease the author points out that it played a very great rôle during the Dardanelles campaign among the German and Turkish troops, as also in the Balkans and in Asia Minor, in spite of the disease being relatively so mild. The French view of the identity of dengue and phlebotomus fever, as put forward by SARRAILLHE in the so-called "Mediterranean dengue," is not acknowledged, the diseases being clinically and epidemiologically different. In tables provided it is shown that the cases in the German Dardanelles force were for 1916, 1917 and 1918 respectively 112, 136 and 101. The local and seasonal distribution is noted; the great majority of the cases occurred in June, July and August. The distribution at the various camps is given in considerable detail, but not the percentages of cases to men. A map of the Dardanelles with its military areas and a view of the hutments in use is provided. It is stated that the spread of the fever was greatly influenced by the strong winds, which brought the phlebotomus flies down from the higher regions. During 1916–17 the landed division at Kilia Tepe was very free from fever, but in 1918 it suffered severely. The orientation of the huts, their exposure to sun, and ventilation were important points. The Turks appear to have had a certain degree of acquired immunity and the author quotes an instance of 38 cases among 60 Germans, and 6 from 120 Turks; the latter often lived in dark, badly ventilated old huts, slept in their clothes, and smoked a great deal. He considers that after an outbreak of the disease an immunity of short duration is conferred on a considerable percentage. Of the 38 affected, mentioned above, 12 had two or three recurrences. In 1916–17 in a German force of 4,000 men, in or near Constantinople, there were 69 cases, but in none of these was there any relapse. When new troops were brought into infected regions the percentage of cases was often high, a common experience

in other countries. The persistence of the infection is probably due to the presence of mild cases and these were noticed for 10–14 days before the outbreak of an epidemic. In the clinical and laboratory notes nothing new is reported, but the paper is a war record of considerable importance.

P. W. B-S.

JAPANESE RIVER FEVER.

KAWAMURA (R.) & YAMAGUCHI (M.). **Ueber die Tsutsugamushi-Krankheit in Formosa, zugleich eine vergleichende Studie derselben mit der in Nordjapan.** [On the Tsutsugamushi Disease in Formosa, together with a Comparative Study of the same in Northern Japan.]—*Kitasato Arch. Experim. Med.* 1921. Sept. Vol. 4. No. 3. pp. 169–206. With 5 charts and 8 plates.

The authors give a very interesting description of tsutsugamushi disease, historical, epidemiological, clinical and zoological, as seen in Formosa and Japan, but there is little in it that has not already been reported and is not in textbooks of recent date. There are some excellent tables of blood counts in man, monkeys and guinea-pigs, and a very detailed technical description of the different mites found. They quote 16 cases, of which one only was fatal: in six the initial lesion was in the genital region, in three in the neck. The Formosan cases have a wider distribution than the Japanese and are rather less severe in character, with a lower mortality; of five cases treated in the hospital, three boys and two girls, leucopenia was considerable in all. Blood examinations were always negative. No distinction could be made by cross immunity experiments with monkeys between the Formosan and Japanese types of the disease; that is, the virus of the disease is the same, though the virulence varies. The transmitter, *Trombidium akamushi* Brumpt, is found on the *Mus alexandrinus*, *M. decumanus*, *Apodemus semotus*, *A. sp.*, dogs, cats, monkeys, buffaloes and birds. The *T. akamushi* must be distinguished from *T. pseudo-akamushi*, *T. gallinarum* Hatori., and *T. corvi* Hatori. Reference is made to the pseudo-typhus of Deli (Sumatra) and the Philippines, and to the Mossman fever of Queensland, which are somewhat similar diseases. No mention is made of the organism described by HAYASHI as the causative agent.

[The relationship of these typhus-like fevers carried by mites, etc., in various parts of the world has been recently shown by MEGAW, who has made a provisional grouping (this *Bulletin*, Vol. 19, pp. 67–8).]

P. W. Bassett-Smith.

KAWAMURA (Rinya), HATTORI (Teikichi) & YAMAGUCHI (Masamichi). [**On the Relation between the Bird and the Red Mite, in Special Reference to the Prevention of Tsutsugamushi Disease.**]—*Tokyo Iji Shinshi* (*Tokyo Med. News*). 1921. Feb. No. 2213. [Summarized in *Japan Med. World.* Tokyo. 1921. June 20. Vol. 1. No. 2. p. 21.]

The examination of birds in the endemic areas of tsutsugamushi disease showed that all species except water fowls and hawk eagles were infested with red mites, corresponding with those of mammals

both in species and in seasonal occurrence. The destruction of all these "carriers," though an essential factor in the prevention of the disease, is unluckily impracticable.

P. W. B-S.

ISHIWARA (Kikutaro) & OGATA (Noriwo). [**A Preliminary Report on the Study of the Etiology of Tsutsugamushi Disease.**]—*Iji Shimbun* (*Med. News*). 1921. Dec. No. 1083. [Summarized in *Japan Med. World.* Tokyo. 1922. Apr. 15. Vol. 2. No. 4. p. 112.]

The authors claim to have found certain spherical bodies in the pathological lesions of the testicles of monkeys experimentally infected. These they were able to cultivate in a special ascitic medium, and from the cultures to infect monkeys.

P. W. B-S.

UNCLASSED FEVERS OF THE TROPICS.

i. HONE (Frank S.). **A Series of Cases closely resembling Typhus Fever.**—*Med. Jl. Australia.* 1922. Jan. 7. 9th Year. Vol. 1. No. 1. pp. 1–13. With 4 charts in text.

ii. STRONG (W. M.). **Cases resembling Typhus Fever.** [Correspondence.]—*Ibid.* Feb. 18. No. 7. pp. 199–200.

i. The notes are given of 16 cases of a peculiar type of fever which occurred in the Adelaide district between February, 1918, and March, 1921, with a mortality of about 20 per cent. The disease is not epidemic, is but little infectious, and runs a course of about 14 days, the fever curve generally dropping rapidly; the typhus-like rash and mental symptoms are very marked and death is usually due to secondary broncho-pneumonia. Diagnosis was difficult, but the close relationship with Brill's disease was early recognized. As an etiological factor the louse could not be incriminated, but a great majority of the infected men had recently been in contact with wheat flour teeming with weevils, and this was thought to have some causative connexion, but beyond coincidence nothing was proved. The serum did not give agglutination reactions with the typhoid group of organisms, and animal experiments were negative. In one case tested the Weil-Felix reaction was positive. There was no definite evidence of importation of the disease, though most of the cases were found at Port Adelaide. Further research is required, particularly as to whether the wheat flour contains other possible sources of infection beside weevils, and systematic examination for the Weil-Felix reaction.

ii. Commenting on the cases described above, Strong suggests that the transmitting agent may be *Pediculoides ventricosus*, a mite-like parasite, which is found at times in corn and is known to cause itching, erythema and urticaria.

[This series of cases is of great interest read in conjunction with those described from India and analysed in the table given by MEGAW (this *Bulletin*, Vol. 19, pp. 67–68).]

P. W. Bassett-Smith.

KEATES (H. C.). **Note on a Case of a Typhus-like Fever occurring at Murree.**—*Indian Med. Gaz.* 1922. Mar. Vol. 57. No. 3. pp. 101–102.

The author describes from memory the case of a lady, aged 55, who became ill three weeks after arrival at Murree (Punjab). There was sore throat and fever, slight improvement on the fourth day, then headache, backache, flushed face, injected conjunctivae, rash on back of hands, forearms, feet and legs; this spread upwards, but the chest and abdomen remained free; it was dusky and macular with some purpuric spots. Temperature 103°, pulse not over 100, slight jaundice and constipation. The temperature fell by lysis on 12th to 14th day; convalescence was slow. Serum reactions for typhoid group were negative. The disease was like typhus, except that there was no rash on the trunk, and the infection did not spread though there were four others living in the house. The case resembled rather Rocky Mountain fever in that it occurred at a high altitude, 7,000 ft., and had a gradual onset with sore throat, and in the distribution of the rash, with dusky red swollen face.

P. W. B-S.

MENDELSON (Ralph W.). **Idiopathic Tropical Pyrexia with Special Reference to Intermittent Non-malarial Fever.**—*Milit. Surgeon.* 1922. May. Vol. 50. No. 5. pp. 547–550. With 1 chart in text.

Forms of non-malarial intermittent fever are common in India, and have been reported by MURRAY as not infrequent in Siam. The case of a European, aged 33, is described. There were few subjective symptoms beyond hepatic and vague rheumatic pains; the pyrexia was of a remittent type and lasted five weeks. The blood picture was peculiar; though the red cells and the haemoglobin content were normal, there was a decided leucopenia (2–4,000) and only 2 per cent. of small lymphocytes and 4 per cent. eosinophiles. Blood examinations for microfilaria, spirochaetes and malarial parasites, and serum tests gave no specific results. Convalescence is rapid in these cases relatively to the length of the illness. The disease is considered to be mosquito-borne, but no proof is given.

P. W. B-S.

BERNARD (P. Noël). **Sur l'action pathogène du** *Bacillus asthenogenes*, **isolé d'une fièvre de cause inconnue observée en Cochin-chine.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 577–587.

The author has on two occasions reported his experiences of a local fever of unknown origin called *fièvre asthéno-myalgique* [see this *Bulletin*, Vol. 16, p. 422; Vol. 19, p. 69], and from the blood and also from the organs after death he has been able to isolate an organism called by him *B. asthenogenes*, which he believes to be causative of the disease in man and animals. He now gives the results of his experiments on young pigs, which are very susceptible. Those severely infected have paresis or paralysis in six to seven days, and die from the 6th to 15th day. Post-mortem they showed evidence of severe toxic infection of the upper part of the intestinal tract, with hepatic, pulmonary, and renal inflammation. The organism passes from the intestine to the blood; it is eliminated by the bowel and kidney. It is found in rice, soil, etc., and in the digestive tracts of

animals. Some cases present the appearances of dry beriberi, from which the disease is frequently not distinguished. In 154 blood cultures he obtained the organism 18 times. Of these 18 cases, two died and two were very severe, with symptoms of beriberi, and the smears from the intestines were like those obtained from infected piglets. The disease was naturally acquired when the animals were fed on (1) polished rice, one feed having been infected with the organism obtained from a human case; (2) sterilized polished rice; (3) autoclaved polished rice, but *not* in those fed on whole rice cooked at 100° C. with an equal part of uncooked rice. Thus the infection can be directly conveyed, it can be indirectly introduced by the spores of the organism, and pre-existing germs in the intestinal tract can develop in the sterilized but favourable media. He thinks that when the disease develops within 10 days on a deficient rice diet the pathogenic organism is *B. asthenogenes*, which is favoured later in its growth by conditions of avitaminosis; that is, in the presence of a gastro-intestinal medium favourable for its growth and fermentation products, microbic and fermentation toxins are formed.

In the discussion WOOLMAN criticized the view that the toxins produced by this organism were the cause of the beriberi syndrome, rather than that the condition of avitaminosis rendered the subject much more susceptible to pathogenic, or even non-pathogenic, organisms in the intestines (MCCALLUM, MCCARRISON, GUERRINI). It is very likely that some of the symptoms of the beriberi syndrome are due to secondary microbic infections. The fact that in his experiments the characteristic symptoms of beriberi and the presence of *B. asthenogenes* infection were found in the piglets fed on polished rice and not in those on whole rice points to the secondary nature of the bacillary infection. The fever in man due to the organism is one of the six-day type tending to relapse, not unlike some forms of dengue.

P. W. B-S.

JOSE AMAYA (Pedro) —**Fiebres climáticas de Tocaima.**—*Report. de Med. y Cirug.* 1921. Dec. Vol. 13. No. 3. (No. 147.) pp. 135–141. With 3 charts.

ERRATUM.

Vol. 19, No. 1, p. 66. CLAPIER summary. For *fevrier asthenomyalgic* read *fièvre asthéno-myalgique.*

BERIBERI.

ASHFORD (Bailey K.). **Beriberi in the Garrison at San Juan, Porto Rico.**—*Amer. Jl. Trop. Med.* 1922. July. Vol. 2. No. 4. pp. 305–340.

Beriberi has not previously been officially recognized at Porto Rico, though it is evident that the various outbreaks of polyneuritis which have been described were probably this disease The author was sent to investigate, as there was a considerable loss of service from this neuritis in the troops at San Juan. He made an exhaustive enquiry, and was present at one autopsy on an acute case which had died with symptoms of tachycardia and apnoea. At the time there were 10 cases in the hospital; all but one of these were recruits of a few months' service and apparently healthy countrymen, living normally on a protein deficient diet. Though the military duty was not really very severe for these recruits, they were in a state of physiological deficiency, and a voluntary reduction of their diet mainly to rice brought about a true deficiency of vitamin B; this, added to the condition of partial protein starvation, caused the appearance of the disease. Most of the men disliked the meat ration at the barracks, which they often refused, and "filled up on rice." The onset of the disease in the spring followed marches or military exercises, and was put down by the men to getting cold feet. There was no evidence of infection or of defective sanitation, and nothing to indicate that alcohol was the cause of the symptoms. The author recommended the use of undermilled rice and the institution of lectures stating the dangers of eating too little meat and of an excess of carbohydrates.

P. W. Bassett-Smith.

TUPAS (Alberto V.). **Observations on Cases of Infantile Beriberi admitted to the Philippine General Hospital during the Year 1920.** —*Jl. Philippine Islands Med. Assoc.* 1921. May–June. Vol. 1. No. 3, pp. 108–110.

During 1920 there was a decided increase in cases of beriberi both in adults and infants, and in the latter an increase in severity. The cases in infants are divided into three types: (1) cardialgic (acute and fulminating); (2) aphonic (subacute and chronic); (3) pseudomeningitic. The last type was first described by Professor ALBERT, and is differentiated from ordinary meningitis by lumbar puncture, and by the curative action of tikitiki extract. In 1920 there were 11 deaths out of 36 cases, or a mortality of 30·5 per cent., as against 6 per cent. in 1919. As most of the babies affected were under three months in age, weaning was never recommended, being considered too dangerous. The usual treatment of 20 drops of tikitiki given every three hours, equal to 5 cc. of the extract in 24 hours, is not considered sufficient by the author, who gave much larger amounts, 3 cc. every hour, and in fulminating cases it may be given continuously with a medicine dropper until 30 cc. has been consumed. The extract may fail in infantile beriberi when (1) the disease is too far advanced; (2) it is associated with broncho-pneumonia; (3) the extract is of inferior quality or the dose is too small.

P. W. B-S.

SULDEY (E. W.). **L'étiologie du béribéri et ses rapports avec les vitamines.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 476–484.

At Makok Mabone, in the Gaboon estuary, in a more or less isolated but cultivated area, with a mixed population living under conditions of defective hygiene, bad climate and food, an outbreak of beriberi occurred chiefly affecting the natives. It followed epidemics of influenza and dysentery and found a number of people with very low resistance. Out of 758 labourers 192 were affected; clinically all types of the disease were present, but 135 were of the severe kind and there were 13 deaths. The small mortality, 7 per cent., is put down to the early and effective treatment. It is stated that practically all the natives have a triple infection of ankylostomes, ascaris, and trichocephalus.

The general ration was 500 gm. of rice, salt fish and a few bananas, but the natives, who habitually live on bananas, when restricted to rice often took it badly. There seemed to be, therefore, semi-starvation, with a deficiency of vitamin B. He states that the cure was easily effected by the administration of 100–150 cc. of fresh palm oil daily, with the addition of cooked bananas in bad cases. From this he gathers that as cooked bananas and palm oil have no vitamins A and B, therefore the disease could not have been caused by their deficiency, [a somewhat rash statement] and formulates this hypothesis: "That beriberi is a highly infectious disease due to an anaerobic microbe, living only in the intestinal canal of subjects who are predisposed by a starchy diet deprived of living ferments or oxydizing substance. The infection is not only carried by the faeces but by contaminated soil," thus following more or less the views put forward by KATO and other Japanese observers. He gives no evidence of his anaerobic organism.

P. W. B-S.

DE MILITA (Vicente). **Beriberi. Su historia en el Estado Apure; primera aparición; epidemias.—Su extensión actual; poblaciones atacadas.** [Beriberi in the State of Apure; its First Appearance, its Epidemy, its Present Extent, and the People Affected.] —*Gac. Méd. de Caracas.* 1921. July 31. Vol. 28. No. 14. pp. 220–228.

This article, originally written for the Third Medical Congress of Venezuela, is an exposition of some peculiar views.

The disease was apparently unknown in Apure prior to 1886, when it was introduced by traders from Guiana. After an interval of six years it again broke out in epidemic form, especially in the Charity Hospital. In 1913 a severe epidemic occurred, and outbreaks were also reported from neighbouring districts. This epidemic continued with varying intensity till 1918, the worst year being 1916.

The sexes were affected equally, but the disease was more virulent in the females. The white population and recent arrivals suffered most. No cases were seen under 15 years of age, and rarely any over 45 years, and in the latter the manifestations were less severe and the course less acute. As predisposing causes, malaria, intestinal parasites, and debility following surgical operations were particularly noticed. The chief exciting causes noted were insanitary dwellings—damp, dark, dirty, and ill-ventilated—and overcrowding, as in the hospital, prisons and the inns, especially if these last were damp and insanitary.

The epidemic always showed greater activity after the rains when the ground was saturated and the streams overflowed.

The diet of the people contains but little rice, and is a mixed one with a tendency to excess of nitrogenous constituents.

Dr. de Milita asserts that "the parasitic nature of beriberi is indisputable," and that the germ lives in the soil and subsoil of the places infected; that it is not communicable from person to person, nor by the bites of insects, but that the patient carries it on his feet and infects the soil of any locality he visits, and that fresh cases arise from this soil infection.*

In the prison disinfection of the cells and rooms was useless, and those to which the occupants were sent temporarily were in turn infected.

He claims that he has prevented the spread of the disease by the simple method of replacing the soil of the hut with fresh sand, and every three or four days sweeping it up, exposing it to the sun and spreading it again. His method of treating patients is to have them removed to a sanatorium, and given sun baths and also "baths" in sun-warmed sand. Little, if any, change is made in the ordinary diet, though, as a precautionary measure, rice is omitted.

H. Harold Scott.

Ohomori (K.), Ohhashi (Y.), Nakanichi (H.), Hara (M.), & Ota (T.). **Studies on the Etiology of Beriberi.** – *Japan Med. World.* Tokyo. 1922. May 15. Vol. 2. No. 5. pp. 128–133.

Dietary experiments were made on six patients and three controls in the hospital, to determine in the course of the disease the result of the addition of varying quantities of vitamin B-containing foods. The results were: (1) mild cases became worse when deprived of vitamin B, and after one week developed oedema with heart attacks; (2) when only a minimum of vitamin B was supplied the result was similar but the symptoms took longer to develop (12 days). With very little vitamin B slight cases developed serious symptoms in three weeks; mild cases showed them in 12 days.

They state that the incubative period is from one to two weeks and depends on the ratio of the food (carbohydrates) to the vitamin; it is shorter when the vitamin is little and food much, than when the vitamin is abundant and calories less. An extreme amount of avitaminosis most often gives rise to heart attacks; out of 53 cases implication of the vagus was present in 35, or 63 per cent. Oryzanin or rice bran extract was used with success.

P. W. B-S.

Taguchi (K.), Hiraishi (S.), & Kwa (F.). **Experimental Polished Rice Diseases in Human.**—*Japan Med. World.* Tokyo. 1922. May 15. Vol. 2. No. 5. pp. 133–135.

These experiments were carried out on five men, divided into two groups: (1) with polished rice and water; (2) with polished rice, salt and water. Very quickly loss of appetite and constipation were marked and all developed beriberi in a short time. The addition of rice extract caused the bowels to act. About the fourth day there was numbness of the legs and about the tenth day anaesthesia of the

* Were these patients free from ankylostomes? If not, the heterodox views of the author may here find an explanation.—[Ed.]

hands and round the mouth. Cardiac dilatation came on suddenly after five days. The urine decreased, but there was no sugar or albumen, neither was there acidosis; the body-weight gradually decreased. Treatment with rice bran extract was successful, and it was noticed that the parts affected first were the last to recover. They conclude that beriberi and the disease produced by polished rice are not absolutely identical, but cannot be distinguished clinically.

[In these cases the effects of starvation were definitely present as well as those of absence of vitamin B.]

P. W. B-S.

TSUKIYE (Sogen). [**Contribution to the Knowledge of Vitamine B.**]—*Jikken Igaku Zasshi* (*Japanese Jl. of Experim. Med.*). 1922. Feb. Vol. 5. No. 6. [Summarized in *Japan Med. World.* Tokyo. 1922. July 15. Vol. 2. No. 7. p. 202.]

The author mentions two forms of vitamin B, an acid form soluble in alcohol as well as in water, and a neutral form soluble in water but not in alcohol. He states that vitamin B given in small quantities has antineuritic power, while if given in large amounts it has a regenerative action on the nerves.

P. W. B-S.

LHUERRE. **Un cas de béribéri humide.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1921. May. Vol. 3. No. 15. pp. 83–84.

The case was admitted to the hospital at Dakar as one of anasarca and bradycardia. Typical symptoms of acute beriberi were present, with serous effusions and cardiac irregularity. The patient was treated with iodide of iron and improved rapidly, though no change is said to have been made in the diet, and he was discharged in six weeks completely cured. It is suggested that the iodide acted as a catalyser.

P. W. B-S.

KANEKO (Jinzo). [**On the Blood Features and Cerebro-Spinal Fluid in Infantile Beriberi which manifested Cerebrospinal Meningitis-like Symptoms and is so-called Meningitis.**—*Jikwa Zasshi* (*Jl. Japanese Soc. Pediatrics*). 1921. Oct. No. 257. [Summarized in *Japan Med. World.* Tokyo. 1922. Mar. 15. Vol. 2. No. 3. p. 87.]

A slight positive globulin reaction of the cerebrospinal fluid was found in infantile beriberi, and the blood showed a low relative increase in the polymorphonuclear leucocytes and a decrease in the eosinophiles.

P. W. B-S.

KAGOSHIMA (Shigeru). [**On the Changes of the Nerves Trigeminus in Beriberi.**]—*Chuwo Gankwa Iho* (*Central Jl. Ophthalm.*). 1922. Jan. Vol. 14. No. 1. [Summarized in *Japan Med. World.* Tokyo. 1922. Apr. 15. Vol. 2. No. 4. p. 118.]

Marked degenerative changes were found both in the medullary sheath and in the axis cylinders of the fibres of the fifth cranial nerve in a case of fatal beriberi, which before death showed symptoms of affection of this nerve.

P. W. B-S.

KUBO (Kow). [**On the Blood Findings in Beriberi in Special Reference to the Blood Platelets.**]—*Tokyo Iji Shinshi* (*Tokyo Med. News*). 1921. July. No. 2237. [Summarized in *Japan Med. World.* Tokyo. 1921. Dec. 15. Vol. 1. No. 8. p. 13.]

The author found an increase of blood plates in beriberi, but this had no definite relation to the severity of the case or to the number of the red cells; it was often associated with an increase of the lymphocytes.

P. W. B-S.

ANDERSON (R. J.) & KUIP (W. L.) **A Study of the Metabolism and Respiratory Exchange in Poultry during Vitamine Starvation and Polyneuritis.**—*Jl. Biol. Chem.* 1922. May. Vol. 52. No. 1. pp. 69–89.

The results of ABDERHALDEN's experiments, in which he measured the CO_2 output in pigeons, are in general agreement with those of the authors on chickens. The experiments were made to determine the changes which occur in the metabolism, or the variation of the respiratory exchange of poultry during vitamin starvation. Readings were taken of normal metabolism during digestion of grain and mash, during digestion of rice, during vitamin starvation, during polyneuritis, and after recovery from polyneuritis, and the results are shown in many tables. With polished rice there is a continuous loss of weight and heat production, and the diminished metabolism is coincident to a great degree with decrease of food consumption; loss of vitamin B results in a practical cessation of digestion and assimilation; after a meal the respiratory quotient at first rises, then falls below normal. When polyneuritis has become well marked metabolism falls very low; the respiratory quotient seldom rose above 0·75, although the crop might contain much undigested rice, and the heat production was 50 per cent. less than the normal; after recovery from polyneuritis the metabolism and heat production rise rapidly, but the gain in weight is slow.

[The rise and fall of the respiratory quotient after food was shown by DODDS (E. C.) to be a normal characteristic, *Jl. Physiol.*, 1921.]

P. W. B-S.

WEILL (E.), ARLOING (Fernand) & DUFOURT (A.). **A propos du rôle de l'inanition dans la carence des pigeons soumis au régime du Riz décortiqué.**—*C.R. Soc. Biol.* 1922. June 17. Vol. 87. No. 22. pp. 169–170.

These experiments were carried out to ascertain whether retention of food in the crop and intestinal obstruction are causes of polyneuritis in pigeons. Twenty birds were fed naturally, or forcibly if required, and water was given by means of a pipette; they were killed at various periods. The rice found in the crop was practically always not more than that given at the last meal; there was therefore no retention. The contents of the intestines were normal in appearance. From these experiments they conclude that the symptoms were not due to inanition due to faulty evacuation of the crop causing a kind of digestive obstruction.

P. W. B-S.

MOURIQUAND (G.), MICHEL (Paul) & NICODIÉVITCH. **Polynévrite expérimentale par le Riz décortiqué et inanition.** —*C.R. Soc. Biol.* 1922. June 17. Vol. 87. No. 22. pp. 168–169.

Three pigeons were fed on 5 gm. and three on 12 to 14 gm. of polished rice daily. All developed beriberi symptoms, the latter in about half the time required in the former; that is to say, the polyneuritis appeared earlier and was more acute when the rice ration was greatest. This indicated that the inanition was not the cause of the symptoms, but that they were dependent on an intoxication, as believed by EYKMAN and BRADDON.

P. W. B-S.

KUMAGAYA (Miyakichi M. K.), OYAMA (Tsunewo), KATSURA (Hohei) & SAITO (Dentaro). [**On Beriberi-like Disease of the Rabbit.**]—*Nisshin Igaku* (*Progress in Med.*). 1922. Jan. Vol. 11. No. 5. [Summarized in *Japan Med. World.* Tokyo. 1922. Apr. 15. Vol. 2. No. 4. pp. 115–116.]

The rabbits were fed on polished rice; the paralysis of the hind legs and other symptoms produced were cured by the administration of vitamin B-containing food. The chief post-mortem changes were atrophy of the viscera, including the heart, and sometimes oedema [starvation characters].

P. W. B-S.

KRAUSE (Dorothy Josephine). **The Water Content of the Tissues in Experimental Beriberi.**—*Amer. Jl. Physiol.* 1922. Apr. Vol. 60. No. 2. pp. 234–243.

The possibility that incipient oedema might be a consequence of all diseases due to dietary deficiencies led the author to examine whether the water content of birds and animals with experimental beriberi and animals on starvation diets was increased or not. Chickens, pigeons, guinea-pigs and rats were used.

The weight of separate organs, or the whole body, was obtained both before and after desiccation and compared. In chickens suffering from polyneuritis there was a possible increase of water in the skin only; in pigeons there was an increase in the intestines, heart, lungs, kidneys, muscles, and skin. In beriberi rats there was an increased content of water in some but not in others. In one guinea-pig with beriberi no increase in water was found. In scurvy guinea-pigs dried whole there was a tendency to an increase of the water content. A quantitative analysis showed evidence of incipient oedema of the tissues in dietary deficiency diseases when it was not possible to see it by ordinary methods.

P. W. B-S.

MONTES (J. E.). **La etiologia infecciosa del beriberi (Nota preliminar).** —Reprinted from *Rev. Filipina de Med. y Farmacia.* 1921. Dec. Vol. 12. No. 12. 12 pp.

The author finds that guinea-pigs injected with blood from beriberi patients give birth to offspring with symptoms and lésions akin to those of infantile beriberi. Liver puncture in beriberi patients has given cultures of *B. mycoides* and other bacilli, and he claims that such patients recover rapidly when vaccinated with these bacilli.

[These bacilli were probably all contaminations of post-mortem growths. *B. mycoides* is not usually pathogenic.]

P. W. B-S.

TOKYO IGAKKWAI ZASSHI (JOURNAL OF TOKYO MEDICAL SOCIETY). 1921. Oct. Vol. 35. No. 10. [**Reports on the Results of Investigations on the Therapy and Prevention of Beriberi.** IRISAWA'S **Clinic for Internal Medicine.**] [Summarized in *Japan Med. World.* Tokyo. 1922. Mar. 15. Vol. 2. No. 3. p. 78.]

Extracts of rice husks were effective both as prophylactic and curative remedies for beriberi, and similar properties were present in beans and meat.

P. W. B-S.

DELANGEN. **O beriberi e as vitaminas.**—*Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1922. Mar. & Apr. Vol. 5. 2nd Ser. Nos. 1 & 2. pp. 18–24. With 1 plate.

ANNOUNCEMENT.

FIFTH CONGRESS OF THE FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE, SINGAPORE, SEPTEMBER, 1923.

By invitation of the Governments of the Straits Settlements and the Federated Malay States, the Fifth Congress of the Far Eastern Association of Tropical Medicine is to be held at Singapore from September 3 to 17, 1923, under the Presidency of Dr. A. E. HORN, Director of Medical and Sanitary Services, Malaya, with Dr. A. L. HOOPS and Dr. R. DOWDEN as Vice-Presidents for the Straits Settlements and Federated Malay States respectively. The first week of the Congress will be devoted to scientific discussions and the second to excursions to places of medical and sanitary interest throughout Malaya. The Governments of the Straits Settlements and Federated Malay States are contributing towards the expenses of the Congress.

The objects of the Association are to advance the science and art of tropical medicine in the Far East by endeavouring to unite into one compact organization the medical profession of the Far East for the growth and diffusion of medical knowledge; to encourage friendly international intercourse among physicians; to raise the standard of medical education; to enlighten and direct public opinion in regard to problems of hygiene; to form habits conducive to the prevention of disease among the native populations; and to publish to the world the results of such scientific observations. Membership of the Association is open to the members of all duly constituted, regularly organized medical societies, and to all medical officers in the civil, military, naval, or other organized services of Governments in the Far East.

Dr. J. W. SCHARFF, Government Health Officer, Singapore, is honorary Secretary and Treasurer for the Fifth Congress, and those wishing to submit papers are requested to communicate with him as soon as possible.

SCURVY.

DELF (E. Marion). **Studies in Experimental Scurvy. With Special Reference to the Anti-Scorbutic Properties of some South African Food-Stuffs.**—*Publ. of the S. African Inst. for Med. Res.* No. 14. 1921. Sept. 14. 105 pp. With 13 figs. & 1 plate.

This is a detailed account of the excellent work done by the author at the South African Institute for Medical Research during eight months of 1921. The results have already been described and noticed in this *Bulletin.* The paper contains an historical survey, abundance of illustrative tables and charts, and to other workers will be most valuable for guidance and reference. Among the number of important points emphasized the following may be mentioned: (1) it is much easier to prevent than to cure chronic scurvy; (2) the harmfulness of *over cooking* all kinds of food; (3) the importance of recognizing prescurvy conditions. The most valuable native antiscorbutic foods are orange, lemon and pawpaw juice, sweet potatoes and green mealies. The value of Kaffir beer was not found to be very great; the long-fermented beer of the Crown mines was the most popular and contained the highest percentage of alcohol, while the Ferrier Deep beer, which is fermented for only a short time (two to three hours as against two to three days), is the better antiscorbutic and contains three to four times more malt than the former, with as much vitamin C as fresh English dairy milk.

P. W. Bassett-Smith.

VEDDER (Edward B.). **The Etiology of Scurvy. IV. Observations concerning the Physiologic Action of the Antiscorbutic Vitaliment.**—*Milit. Surgeon.* 1922. May. Vol. 50. No. 5. pp. 534-546. With 8 charts in text.

The author describes further work on guinea-pigs with relation to the etiology of scurvy, particularly with reference to the action of the internal secretions. These experiments gave no evidence to indicate that a deficiency of the secretions of the thyroid, adrenals, or pituitary glands could cause scurvy. He found that the antiscorbutic vitaliment was not present in the circulating blood, urine, or faeces of healthy animals. It was not found in the red blood cells, muscles, or bones, but was present in the fresh liver, kidney, spleen, pancreas, thymus and brain; it is, however, not stored in the e organs as such, and must therefore form a component part of their tissues. He states that these facts support his theory that the vitaliments act as "building stones," and that cellular metabolism ceases when these essential elements are withdrawn. It is evident that as they are not stored they must be replenished daily.

[It would seem that the bearing of these experiments on scurvy in man is open to question, since animal food is an unnatural diet for guinea-pigs. The presence of vitamin in organs has been previously shown by workers at the Lister Institute.]

P. W. B-S.

THURSFIELD (J. H.). **A Lecture on Rickets, Marasmus, and Scurvy.**—*Lancet.* 1922. Sept. 9. pp. 551–553.

In this lecture the author emphasizes the fact that in his clinical experience since the war, all but one case of infantile scurvy seen by him were due to the use of a well known and much advertised form of dried milk. The source of marasmus has still to be found out, and for that of rickets the old view of CHEADLE still holds good. A deficiency of fats and to a less extent of proteins and phosphates, favoured by and aggravated in degree by bad external hygiene, want of light, warmth and pure air. The theories of MELLANBY, Noel PATON and HESS are discussed.

P. W. B-S.

ALEXANDER-KATZ (Edith). **Larvierte Barlowsche Krankheit und ihre Differentialdiagnose.**—*Deut. Med. Woch.* 1922. Apr. 28. Vol. 48. No. 17. pp. 557–558.

The case is reported of an infant, 10 months old, who had symptoms of disease about the hip joint, viz., flexion, abduction, shortening and pain, without any definite signs of scurvy. The child was born of healthy parents, had been brought up on the bottle, and had not been ill before; no vegetables or fruit had been given. Two weeks before admission it had become sickly and suffered from pains. Rest did not improve the condition and Barlow's disease was diagnosed. The child was then given fresh cow's milk, raw carrot juice, and a quarter of a lemon daily. Recovery was rapid and complete. It was thought that haemorrhage had taken place into the capsule of the joint and that the case demonstrated the difficulty of diagnosis in early stages of the disease, especially when the symptoms are unusually localized.

P. W. B-S.

TUPAS (Alberto V.). **A Report of Two Cases of Scurvy in Breast-fed Infants.**—*Jl. Philippine Islands Med. Assoc.* 1921. Jan.-Feb. Vol. 1. No. 1. pp. 23–24.

The cases were respectively one and two months old. The signs were few, mostly arthritic, showing the X-ray picture common in scurvy, namely, the white line at the epiphysial margin. In neither was there any haemorrhage from the gums. The cures were rapid and complete when lemon juice was given. The diet of the mothers consisted mainly of rice, vegetables, fish, and rarely meat, and was probably deficient in antiscorbutic vitamins.

P. W. B-S.

HAUSMANN (Theodor). **Das Blutbild bei Skorbut mit Berücksichtigung der Linksverschiebung.** [The Blood Picture in Scurvy, with Special Reference to the Shift to the Left.]—*Ztschr. f. Klin. Med.* 1922. Mar. 3. Vol. 93. No. 4/6 pp. 346–357.

From the examination of the blood in 24 cases of scurvy, details of which are given in a tabular form, the author concludes that there is always a reduction in the relative number of the polynuclear cells, even when conditions usually producing an increase are present. A definite reduction in the total white cells and a relative lymphocytosis are usually present. The Arneth count did not show a move to the left as might have been expected, thus confirming the view that etiologically scurvy is non-infectious. By the relative decrease in the polymorph cells scurvy blood films are distinguished from those

of haemorrhagic diseases of a septic nature. [It must be remembered that septic conditions may be sequelae of true scurvy.] Urobilinuria, together with achlorhydria is only seen in severe cases of scurvy associated with degeneration of the tissues.

P. W. B-S.

MOURIQUAND (G.) & MICHEL (P.). **De l'action de certains aliments gras sur le métabolisme osseux. Adjuvants et antagonistes de la substance antiscorbutique.** —*C.R. Soc. Biol.* 1922. May 27. Vol. 86. No. 19. pp. 1170–1172.

The experiments were made with guinea-pigs, and the fats used were butter, olive oil, and cod liver oil, with a basic diet of barley plus fresh lemon juice. Those given daily 2·5 cc. of olive oil showed no evidence of scurvy lesions from the 38th to the 160th day. One only out of seven on 5 gm. of butter was affected; it died on the 55th day. Ten were given 2·5 cc. of cod liver oil; these without exception presented typical bony changes.* As the iodine in the oil might possibly have some action, other guinea-pigs were given with their daily diet a quantity of iodine corresponding to that present in 2·5 cc. of cod liver oil; none of the animals showed any signs of scurvy up to the 150th day; when hay was added to the diet of barley, lemon juice, and cod liver oil no signs of scurvy were noted. [This is a very unnatural diet for guinea-pigs and liable to cause intestinal troubles, if taken.] The authors consider that these results show the favourable action one food may have when given in combination with an otherwise scurvy-producing diet. The unfavourable results of cod liver oil on guinea-pigs are interesting when its curative effects on man and rats is remembered.

[The condition in guinea-pigs is more that of rickets than true scurvy, and deductions from animals fed on diets unnatural to them must be made with great care.]

P. W. B-S.

MOURIQUAND (G.), MICHEL (P.) & BARRE (Léon). **Croissance et substance antiscorbutique.**—*C.R. Soc. Biol.* 1922. May 27. Vol. 86. No. 19. pp. 1167–1169.

From their experiments on guinea-pigs the authors conclude that the absence of antiscorbutic substance (given in lemon juice) does not modify appreciably the growth of the young animals during the period which precedes the characteristic bone signs; the changes in weight generally come on with these signs and run parallel to them.

P. W. B-S.

JOHNSON (J. M.). **The Comparative Antiscorbutic Values of Milk.**—*Public Health Rep.* 1922. Apr. 28. Vol. 37. No. 17. pp. 989–1021. With 15 charts in text.

The author carried out a large number of experiments with guinea-pigs, using fresh milk and various forms of preserved, reconstructed, pasteurized, and dried milks. Full reports and charts of the results obtained are given. He emphasizes the importance of making complete pathological studies of the bones, which will often show evidence of the disease not noticeable clinically, and states that no reliance can

* The sample of cod liver oil may not have been a good one.

be placed on reports without these studies. The amount of antiscorbutic vitamin in fresh milk is not very great and is injured by any process of drying. It is not wise to depend upon certified milk; strong antiscorbutic material, such as orange juice, should be added. One brand of dried milk powder appeared to have retained a large amount of its antiscorbutic substance; this was not due to the process used, as other brands made the same way and by the same company were very deficient. The use of whole milk powder and skim milk powder made by the roller process gave no better growth than the spray process milk powders or the pasteurized milk. The age of the milk before treatment (even in respect of a few hours) appears to exert an important influence, as also the amount of the milk consumed by the animals, none of which was forcibly fed.

P. W. B-S.

COHENDRY & WOLLMANN (E.). **Quelques résultats acquis par la méthode des élevages aseptiques: (1) Scorbut expérimentale: (2) Infection cholérique du cobaye aseptique.**—*C.R. Acad. Sci.* 1922. Apr. 18. Vol. 174. No. 16. pp. 1082–84.

The authors' experiments before the war had shown that in guinea-pigs aseptic from birth, as well as in those nourished on sterilized food, debility and paresis of the hind quarters occurred. His new work has been specially directed to the detection of these or other evidences of scurvy. It was definitely demonstrated that more or less completely bacterially-sterile animals (for in time they frequently became contaminated) did show other signs, such as looseness of the teeth and brittleness of the bones, which are manifestations of avitaminosis, and are adverse to the theory that scurvy has a microbic origin. SCHOTTELIUS, experimenting with chicks, has recorded similar observations and results. The author states that by adding sterile orange juice to the autoclaved diet of these bacteria-free animals he noticed for the first time that there was an increase of weight in 80 per cent.

P. W. B-S.

LABORATORY METHODS.

FULLEBORN (F.). **Einige Beiträge zur mikroskopischen Technik.** [Contributions to Microscopical Technique.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 2. pp. 44–57. With 1 plate.

In these contributions to microscopic technique the author draws attention to some methods, and fully describes certain modifications, that have proved valuable to him in his helminthological studies, and one or other of which he thinks may be found useful in the study of pathological anatomy, zoology, etc. This he does under five headings :—

1. "Mikro-Kaiserling" Preparations.

Small haemorrhages in tissues, blood distribution in capillaries, etc., may very often be well shown in simple razor-sections of organs treated and preserved by the Kaiserling process.

Small pieces of the organ to be examined are put into Kaiserling I solution and are kept there for 24 hours. Razor-sections are then made, and these are treated with absolute alcohol for $\frac{1}{4}$–$\frac{1}{2}$ hour before they are transferred into Kaiserling II solution. They may be mounted on slides direct in Kaiserling II, which is evaporated down before the cover-slip is sealed with glycerine jelly; or they may be embedded in glycerine jelly after having been kept in small dishes of Kaiserling II in a paraffin oven for 24 hours to allow the solution to concentrate. After some months the sections slowly fade, but still remain useful.

2. Cyanochin to show the Superficial Structures of the Cuticle of Worms.

On the principle of the Indian ink method of demonstrating spirochaetes, Cyanochin, as lately used by BRESLAUER to show the superficial structures of Infusoria, shows the superficial structures of small nematodes very well, and perhaps also may be used for small trematodes. The living material may be used, or the larvae allowed to dry on a slide and the Cyanochin solution poured over it. If fixed with alcohol after drying and then treated with Cyanochin, the bodies of the larvae stain deep red. Cyanochin preparations, without cover-slip and without balsam have kept unaltered for about $1\frac{1}{4}$ years.

3. Squash Preparations of Worms and Tissues on Permeable Celloidin.

Squash preparations play an important part in the examination of worms and in the search for them in fresh tissues; and may occasionally be found useful in the domain of Protozoology also. Naturally, microtome sections supplement squash preparations when the finer structural alterations caused by the parasites and the exact relations of parasite to tissue are to be studied; but squash preparations have the advantage of giving a general idea of the worm, showing it whole, so that it can be measured and examined.

To overcome the difficulties experienced in the fixation and subsequent manipulation of squash-preparations made between glass slides the author recommends a device of putting the material to be squashed between a strip of celloidin permeable to fixing fluid and a cover-glass and interpolating the whole between two glass slides through which the pressure is exerted. Tearing and detachment of the tissue on separating the slides is thereby prevented. The covers ip and celloidin underlayer stick close together, and can, if desired, be treated as a celloidin section in further manipulations. The preparation of

the sheet or strip of celloidin and the subsequent manipulations of the material squashed between it and the coverglass are very fully described in the paper.

4. The Coverslip-Celloidin-Chamber Method of Preserving Worms, Protozoa, etc.

The author has hitherto used this method only for worm larvae and infusoria, but thinks it may be useful for other material as well.

When examining small organisms in water, normal saline, etc., put a drop of the fluid containing them on a thin celloidin sheet laid on a slide and place a coverslip on top. If material worth preserving is found, bind the coverslip to the celloidin underlayer. The entrapped material can be then conveniently dealt with. Full directions for dealing with it are given in the paper.

5. Preparations cut or punched from Celloidin Plates in which Small Free Living Animals have been incorporated.

This method of dealing with small free-swimming organisms is fully described: the general principles are as follows:—

After the organisms present in a bulk of fluid have been killed, centrifugated and fixed, the fixing fluid is removed, the deposit washed [stained if desired], and brought through the various dilutions of alcohol up to absolute. In about half an hour or less add an equal quantity of ether and as much celloidin solution as will form a solution of quite fluid consistence and then pour the mixture with the contained objects distributed through it in not too thin a layer on slides that have been smeared with sugar-dextrin solution and dried. After ½–1 minute, the slides are placed in water (or first into 70 per cent. alcohol) and the celloidin films with the organisms incorporated peal off and can be further dealt with as celloidin sections, or otherwise as desired.

The interesting statement may be noticed that the stunted first pinion feather of the snipe's wing, about 2 cm. long and 3 mm. broad, has a fine rounded, stiff, and uniformly elastic point, and is for fine microscopic work by far the most delicate instrument known to the author.

J. D. Thomson.

MALONE (R. H.). **The Demonstration of the Capsules of the Pneumococcus by a Modification of Benian's Relief Stain.**—*Indian Jl. Med. Res.* 1922. Apr. Vol. 9. No. 4. pp. 804–805. With 1 plate.

A thin smear of the material to be examined, fixed by heat and allowed to cool, is stained in 2 per cent. aqueous solution of Congo red for about a minute. Excess of stain is then drained off, and the smear allowed to dry in air. It is then treated with 1 per cent. HCl in 96 per cent. alcohol for a few seconds, and again allowed to dry. When dry it is counterstained with 0·5 per cent. aqueous solution of methyl violet (or gentian violet) for about a minute, after which the excess of stain is flushed off with tap water, and the smear is blotted with filter paper or is allowed to dry in air. It is then ready to be examined with an oil immersion lens.

The value of this method as a means of differentiating pneumococci from allied organisms lies in its simplicity and the absolute certainty with which, according to the author, capsules can be demonstrated.

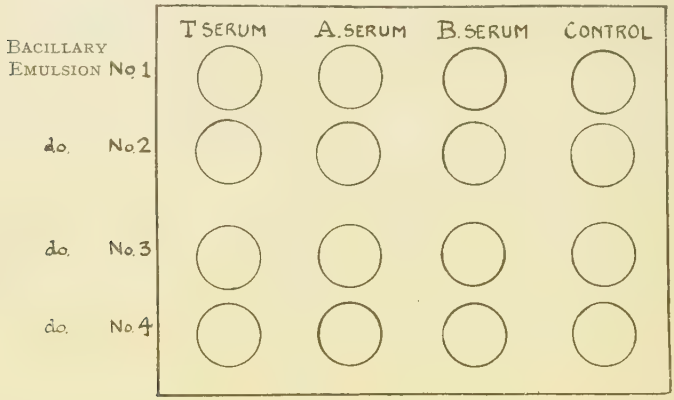
A coloured plate illustrates the appearance and manner of staining.

J. D. T.

MACKIE (F. P.), with TRASLER (George). **Laboratory Records from Mesopotamia.**—*Indian Med. Gaz.* 1921. Nov. Vol. 56. No. 11. pp. 411–418.

The first instalment of these records contains much that is interesting concerning the organization and development of Laboratory work in Mesopotamia during the Great War, but is referred to here simply to extract the following from the section treating of the enteric fevers:—

"We used a very simple method for our agglutinations which requires little apparatus and is quick and efficient. It was as follows:—Take a quarter-plate negative and clean off the gelatin in hot soda solution. Make rings on the glass with vaselin (as those made with a grease pencil are apt to break and allow the fluids to mix). For this purpose take a piece of wide rubber tubing, ¾ in. diameter, cut it cleanly across and use it to stamp out rings. This is done by putting some filter papers at the bottom of a cigarette tin and saturating them with melting vaselin. The rubber tube is kept in the tin and the filter paper used as a vaselin pad. By pressing the end of the tube first on the pad and then on the glass plate a series of hollow grease rings of uniform size are quickly made.



Illustrating quarter-plate negative with vaselin rings arranged for examination of four colonies.

"A quarter-plate negative will take sixteen rings in four rows of four in each row.

"One drop of saline is put in each ring and in each horizontal row a suspected colony is emulsified. Four colonies can be examined on one plate.

"When the colonies are emulsified take the standard T.A.B. high titre sera in a dilution of about 1 in 100 and put one drop of T. serum in each of the rings in the vertical column under T. and similarly with A. and B. sera. The fourth vertical row should have one drop of saline or of dilute normal serum added as a control. If this shows agglutination it means the organism is auto-agglutinative and nullifies all the tests in that horizontal row.

"As a matter of fact we never found either T.A. or B. auto-agglutinative, and if the control showed such a change the organism could safely be excluded as one of the enteric group.

"The above diagram makes the technique clearer.

"It is obvious that any organism and any serum may be examined in this way and if the bacillus is an unknown one which might be one of the dysentery, cholera or food poisoning group we used row Nos. 2 and 3

to test it with high titre sera of Shiga Flexner, Cholera and Gaertner. In this way the potentialities of an organism as regards its serum reactions may be quickly and easily tested. In a country like Mesopotamia where a fierce dry 'shamal' wind was frequently blowing it is essential to keep the agglutination plate in a moist chamber and this is best done by laying wet filter papers at the bottom of a large Petri dish and supporting the plate on glass rods. If the Petri dish be lined with black paper or over-exposed negatives used from which the gelatin has not been removed it is possible to make the observations on the progress of agglutination with a hand lens without removing the cover of the Petri dish.

"Using the dilutions of serum mentioned, it is generally easy to detect agglutination in a few minutes, generally under 10 minutes, and by taking the colony direct from the plate to give the clinician a report in 24 hours from receipt of the specimen.

"After this preliminary report we used to put the organism up to the four sugars mentioned [lactose, glucose, mannite and dulcite] and to the titre limit of the sera. It is not necessary to use pipettes or tubes at all, as all the dilutions may be made on plates as described and if the moist chamber is used observations can be made 24 hours later without any risk of the dilutions drying up.

"Widal reactions may be made with the same technique. Though we found it more accurate to use Wright's tubes or better Dreyer's technique."

J. D. T.

HARVEY (W. F.). **Bacteriological and Laboratory Technique. Sections IV, V & VI.**—*Indian Jl. Med. Res.* 1922. Jan., Apr. & July. Vol. 9. No. 3 & 4. pp. 405–444; 692–725; and Vol. 10. No. 1. pp. 1–56.

The fourth instalment deals with standardization, the particular items being numbered from S7 to S8.23.

The fifth and sixth instalments deal with "Cultural Methods" and with "Stains and Staining" respectively—the particular items under Section V (Cultural Methods) being numbered from C4.1 to C4.553, those under Section VI (Stains and Staining) from S4.1 to S4.333. Each section has its own index arranged alphabetically.

J. D. T.

JOSEPH (F. H.). **A Simple Device for collecting Blood for Transmission to a Laboratory at a Distance for Subsequent Estimation.**—*S. African Med. Rec.* 1922. Aug. 12. Vol. 20. No. 15. pp. 282–284. With 5 text figs.

Those interested will find in the original a full description, illustrated by text figures, of the apparatus which would be supplied from laboratory to the practitioner; directions for the collection and dilution of the blood; an account of the laboratory examination; and a statement of the advantages of the special appliance both to the practitioner and to the laboratory worker.

The apparatus is suitable not only for sending by post but also for collecting specimens under any conditions where it is not convenient to examine them immediately. By using the special solutions that are recommended, viz.:—

(*a*) For erythrocytes. Sod. chloride (pure) 1·2 gm.; formalin, 2 cc.; distilled water to 100 cc. filtered;

(*b*) For leucocytes. 1 per cent. aq. solution of methyl green (0·0) 3 cc.; 1 per cent. acetic acid to 100 cc. filtered;

it is said that the cells remain well preserved up to 72 hours, and that the counts obtainable at the end of this period are essentially the same as those made immediately after collection.

"It is claimed for this device, therefore, that reliable estimations are given by its use, and that, as specimens will keep satisfactorily for at least three days, it solves the problem of making blood-counts at a distance."

J. D. T.

i. DREYER (Georges). **A Simple Procedure for the Accurate Enumeration of Blood Cells and Bacteria without the Use of a Counting Chamber.**—*Lancet.* 1921. Jan. 29. pp. 219–221.

ii. WAUGH (Theo. R.). **An Efficient and Practical Method for the Counting of Red Blood Cells.**—*Arch. Intern. Med.* 1922. Aug. 15. Vol. 30. No. 2. pp. 216–220.

i. The procedure described in this article, although based on the same general principles as WRIGHT's method for determining the number of bacteria per unit volume of a given suspension "differs in that it can be used to count not only bacteria but also human blood cells, and that the standard consists of a permanent suspension containing an exactly determined number of corpuscular elements per unit volume." . . . .

"The corpuscular elements selected for the preparation of the standard emulsion are the red corpuscles of the blood of a hen. The fowl should be young and in good health. The reasons for the selection of the red cells of the hen are the following :—

"1. The cells are of uniform size.

"2. They are of approximately the same specific gravity as mammalian red cells.

"3. The cells are slightly larger than the human red cell or average mammalian red cell.

"4. They are readily distinguished from mammalian red cells by their elliptical shape and the presence of nuclei, which make it impossible to confuse them with mammalian red cells in a mixture of the two.

Preparation of the Standard Suspension.

"Prepare a solution containing approximately 1·3 per cent. perchloride of mercury in sterile normal (0·85 per cent.) saline solution. Bleed the fowl directly into this solution, allowing approximately 1 c. cm. of blood to each 100 c. cm. of the solution. Agitate the recipient fluid gently while the blood is being added, so as to ensure a thorough mixture. Leave for one hour, shaking from time to time to prevent sedimentation of the blood. At the end of the hour centrifugalise *just enough* to deposit the red cells, pour off the supernatant fluid, and fill up to the original volume with a solution of 4 per cent. perchloride of mercury in normal saline solution. Allow the mixture to stand for six hours, occasionally shaking the flask or bottle. At the end of this time agitate the flask to emulsify the cells and then centrifugalise. Wash the cells twice with normal saline solution, each time emulsifying them before centrifugalising. Pour off the supernatant fluid, and fill up to the original volume with normal saline solution to which has been added a minute amount of perchloride of mercury, *i.e.*, just enough to prevent bacterial infection.

"The suspension is now ready for standardisation. As the result of a large number of experiments, I have arrived at the conclusion that a convenient suspension to work with is one which contains about 20,000 cells per cubic millimetre. Therefore, the suspension should be brought to this standard in the usual manner, using normal saline solution as the diluting fluid, and counting at least 1,000 cells in each of 10 successive drops, or about 10,000 cells in all.

"Standard suspensions thus made have been kept for eight months at ordinary temperatures without showing any change in the number or appearance of the corpuscles.

Determination of the Number of Red Cells in a Given Blood by Means of the Standard Suspension.

"The blood, taken in the usual manner, is diluted 1 : 200, with a solution of 1·3 per cent. perchloride of mercury in normal saline solution. For example, one adds 0·1 c. cm. of the blood to 19·9 c. cm. of the mercury saline solution, previously measured into a test-tube, carefully washing out the blood pipette and thoroughly mixing the resulting dilution. The tube containing the blood dilution is shaken to secure an even distribution of the cells in the suspension and immediately 1 volume—*e.g.*, 0·1 c. cm.—of the fluid is transferred to a dwarf test-tube. In the same manner the tube or bottle of standard suspension is shaken and an equal volume of this fluid is measured into the dwarf test-tube, which is agitated so as to mix the fluids thoroughly. A drop of the mixture is placed immediately upon a clean slide and covered with a coverslip, care being taken to avoid air bubbles. The drop should be only large enough to form a thin film between the coverslip and the slide, and not so large that the coverslip floats. A coverslip of convenient size is 22 mm. × 22 mm."

For counting, one uses a dry lens of convenient magnifying power and may obtain a field of convenient size by cutting from a piece of black paper a small diaphragm with a central square aperture of desired size, and placing this in the eyepiece. The extreme periphery of the area covered by the coverslip should be avoided, and at least 500 cells in each of two drops from the same mixture should be counted.

To calculate the number of red cells contained in each cubic millimetre of the blood examined, multiply the factor which has for its numerator the sum of all the blood red cells counted and for its denominator the sum of all the corpuscular elements of the standard suspension counted in the same fields by the number of corpuscular elements in each cubic millimetre of the standard suspension, and then by the dilution of the blood.

"*Example.*—Suppose the standard suspension contains 21,000 nucleated red cells per cubic millimetre. The blood sample is diluted 1 in 200. A drop of a mixture of equal volumes of these two solutions is prepared for the microscope and about 50 fields are counted. The sum of the nucleated red cells in the 50 fields is 319; the sum of the human red cells in the 50 fields is 405.

$$\frac{405}{319} \times 21{,}000 \times 200 = 5{,}294{,}000$$

"Therefore the blood examined contains 5,294,000 red cells per cubic millimetre.

Leucocyte Count.

"To determine the number of leucocytes in a given blood sample by this method the procedure is as follows :—

"Into a dwarf test-tube measure three volumes of a 0·3 per cent. solution of acetic acid in distilled water, to which has been added 0·6 per cent. of a 1 per cent. solution of methyl-violet (6B). Add one volume of the blood to be examined, mix carefully, and allow to stand for a short time until the human red cells are haemolysed. Then add one volume of the standard suspension of nucleated red cells and mix carefully. Place a drop of the mixture on a clean slide and cover with a coverslip, observing the same precautions as in the case of the red-cell count previously

described. For counting use the same objective and ocular as for the counting of red cells, but the paper diaphragm previously used in the ocular should be left out, and the nucleated red cells and leucocytes present in the whole field should be counted. The same total number of cells—*i.e.*, about 500—should be counted as in the case of the red cell determination.

"The calculation of the number of leucocytes per cubic millimetre of blood is performed in the manner already indicated above—namely, by dividing the number of nucleated red cells into the number of the leucocytes, and multiplying this factor by the number of cells in 1 c. mm. of the standard suspension. If dilutions other than those here indicated are used the calculation will naturally have to be modified accordingly.

"*Example.*—Suppose the standard emulsion contains 21,000 nucleated red cells per cubic millimetre. One volume of the blood to be examined is added to three volumes of the acetic-acid-methyl-violet solution, and mixed. To this mixture is added one volume of the standard suspension. Seventy fields are counted, giving a total number of 409 nucleated red cells and 145 leucocytes.

$$\frac{145}{409} \times 21{,}000 \doteq 7{,}445.$$

"Therefore the blood examined contained 7,445 leucocytes per cubic millimetre.

Enumeration of Bacteria.

"For counting bacteria in a suspension the following technique has been adopted :—

"A special standard suspension for this purpose is prepared as follows : The perchloride-fixed nucleated cells are washed several times with normal saline solution to remove the free perchloride, and then made up with sterile normal saline solution to a standard of about 30,000 per cubic millimetre. To secure sterility a minute amount of formalin is added. For the purpose of counting a mixture of one volume of the standard suspension, one volume of the bacterial suspension suitably diluted, and one volume of 0·5 per cent. methylene-blue solution is prepared and counted, as in the case of the blood count, enumerating the nucleated cells and the bacteria in each field.

"*Example.*—Suppose the standard suspension contains 30,000 cells. The bacterial suspension is diluted 1 in 200. Into a dwarf test-tube is measured : one volume of the standard suspension, one volume of the diluted bacterial suspension, one volume of 0·5 per cent. methylene-blue solution, and the test-tube shaken to thoroughly mix the contents. A drop of this mixture is immediately transferred to a slide, covered with a coverslip, and counted as in the case of the white cell count, except that an oil immersion lens is used. Eighty fields are counted, giving a total number of 500 nucleated red cells and 400 bacteria.

$$\frac{400}{500} \times 30{,}000 \times 200 = 4{,}800{,}000.$$

"Therefore the bacterial emulsion contains 4,800,000 bacteria per cubic millimetre."

After making an extensive series of comparative counts to compare the relative merits of this method with those of the counting chamber, the author concludes that :—

"By careful procedure, and by counting the numbers of cells indicated . . . the method discussed in this paper yields extremely accurate results, which compare more than favourably with the results obtained by the use of a counting chamber. It furthermore possesses the following distinct advantages : (1) it can be used with equal facility for counting erythrocytes, leucocytes, and bacteria ; (2) it does away with the use of a costly counting chamber ; (3) it is quicker and less fatiguing to the eye."

ii. While commending DREYER's method for its "universality and accuracy," the author of this paper introduces changes in the constitution of the standard suspension and in the technique employed, and then concludes that "a procedure is devised which has distinct advantages for the enumeration of erythrocytes and offers a method which is rapid, accurate and clinically practicable."

The reasons given for using "crenated, fixed and stained human red blood cells" in place of avian erythrocytes as the corpuscular elements in the standard suspension are hardly likely to be taken seriously. The clinician might, if necessary, be supplied with a standard suspension in which the avian normal erythrocytes are suitably stained.

The use of the standard suspension to dilute the blood to be examined is not to be commended, even although the error introduced "is" (owing to the high dilution, 1 to 200) "of no clinical consequence."

The changes in technique are supposed to simplify the calculation of the patients' red cells, but this is more apparent than real. With DREYER's more accurate technique and a standard suspension of 20,000 corpuscles per c.mm., the calculation, though differently stated, resolves itself into multiplying by 4 in place of by 5 as required in the example given in this paper under the heading "Calculation of the Patient's Erythrocyte Count."

J. D. T.

POLIDORI (V.). **Préparation simple d'une éosinate de bleu de Méthylène pour colorations hématologiques.** *Bull. Soc. Méd.-Chirurg. Indo-Chine.* 1921. July. Vol. 12. No. 1. pp. 87–89.

For double staining of blood films the author recommends the following stains as being easy of preservation and simple in use.

Three stock solutions are prepared, all of which will keep well, namely: (A) a concentrated solution of Borrel blue; (B) a solution of 1 gm. of medicinal methylene blue in 10 cc. of methyl alcohol, to which solution 90 cc. of 90 per cent. alcohol is added and the whole filtered; (C) a 1 per cent. alcoholic solution of eosine.

For use, equal parts of solutions B and C are mixed (the mixture keeps good for several days) and the unfixed film is flooded with 15 drops of this mixture and left for three minutes. The film is now placed in a staining dish containing a 1·5 per cent. filtered dilution of solution A, being first placed face upwards for 30 seconds during which the dish is oscillated, and then turned face downwards and left at rest for 10 to 15 minutes, after which it is washed.

A. Alcock.

EPSTEIN (H.). **Ueber eine neue Methode der Blutzellen- und Blutparasitenfärbung. Vorläufige Mitteilung.** [A New Method of Staining Blood Cells and Blood Parasites. Preliminary Communication.]—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Apr. 13. Vol. 88. No. 2. pp. 164–168.

The method which the author describes depends on the metachromatic properties of Toluidin blue, and on the characteristic nuclear staining element "Rot aus Toluidinblau" (probably analogous to "Rot aus Methylenblau") being increased by the addition of an organic salt of lithium.

Two solutions are required :—

Solution A.—Toluidin blue	.. .. ..	1 gm.
Lithium citrate	.. .. ..	1 gm.
Distilled water (neutral)	.. ..	100 cc.

The lithium citrate is first dissolved in the distilled water at room temperature. The Toluidin blue is then added and dissolved and the whole is then passed through moistened filter paper to remove a colloidal deposit which forms and in part sticks fast to the vessel. The filtrate is now ready for use.

Solution B.—A saturated solution of Picric acid in distilled water.

Thin films or smears of blood, exudate, or organs fixed in methyl alcohol, are stained in solution A. Slide preparations should be immersed vertically in suitable receptacles containing the stain, while coverslip preparations should be floated (film down) on the surface of the staining fluid. Smears of mammalian blood are sufficiently stained in 15–30 minutes, those of bird and amphibious blood in 10–20 minutes. But while there is an optimum time which can be found for each class of object by trial, there seems to be little danger of overstaining. According to the author, thin smears, even if left for 24 hours in the stain, remain delicately stained and transparent.

When sufficiently stained the smears are washed under the tap. To the naked eye they should now appear transparent and of a delicate greyish blue colour. They are then immersed in solution B for 1–3 seconds or until the colour changes to light green. After this they are thoroughly washed for a few seconds under a strong stream of water and then dried with filter papers. Solution A can be used over and over again, so that 30–35 cc. in a suitable vessel for slides is capable of staining several hundreds of smears. Solution B has to be changed as soon as its original golden yellow colour assumes a greenish tint. 30–35 cc. in a suitable vessel suffices to differentiate 15–20 smears.

The author, after using this method daily for over six months and controlling it frequently with Pappenheim's stain, recommends it to his professional colleagues as reliable for clinical blood examinations. The results are, he says, clean and sharp, without deposit, and in colouring differ from the common methylene blue-eosin stains (including Giemsa) only in that the erythrocytes and eosinophile granules are stained green. The solutions are easily prepared and require neither glycerine nor alcohol in their preparation, which under certain circumstances may be a distinct advantage. The stain is always ready for use, acts quickly, and can always be depended upon to give reliable and uniform results.

The oxalate or the tartrate may be used in place of the citrate of lithium in the preparation of the stain. With the tartrate the erythrocytes are said to stain most delicately—an advantage in staining the blood of birds, fishes, amphibians and reptiles; but similar results may be obtained by diluting the citrate stain 1 : 10 and lengthening the time of staining. The author hopes to investigate the chemistry of Toluidin blue, the influence of the hydrogen-ion concentration on its solutions, etc., and to communicate his results later on.

J. D. T.

i. Puente (J. J.). **Technique facile pour la coloration des spirochètes dans les frottis.**—*C.R. Soc. Biol.* 1922. Feb. 18. Vol. 86. No. 7. pp. 410–411.

ii. Renč (V.). **Ueber eine neue Modifikation der Spirochätenfarbungs methode.**—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Apr. 13. Vol. 88. No. 2. pp. 174–176.

i. After a number of trials the author of this paper found that Sahli's boracic blue, recently prepared or metachromatic, gives clear coloured images on clean preparations. His technique is as follows :—

1. Prepare thin smears of the material to be examined.

2. Fix in Ruge's solution (formol 2 parts, acetic acid 1 part, water 100 parts).
3. Complete the fixation in ether-alcohol.
4. Filter and heat in a test-tube the following solution: Tannin 5 per cent., 3 parts, chlorhydrate of anilin 3 per cent., 1 part, until it boils, and pour the boiling liquid over the smear and leave it to cool.
5. Flush off the solution and wash the smear in running water.
6. Stain for one minute in boracic methylene blue.
7. Flush off the stain, dry, and examine.

Treponema pallidum stains blue and is recognized by its morphological character.

ii. This author, having experienced many disadvantages pertaining to the original "Tribondeau" method here describes a modification which he claims to have abundantly tested; and, after having compared it with Giemsa and other useful methods, he considers that it is the easiest, quickest, and most reliable of all.

Solutions required :—

I.	Tannin	5 gm.
	Acid acetic	2 cc.
	Formalin 4 per cent.	5 cc.
	Distilled water	40 cc.
	Alcohol 96 per cent.	60 cc.
II.	Nitrate of silver	5 gm.
	Distilled water	100 cc.
	Liquid ammonia, q.s., added drop by drop until the brownish cloud which first forms is redissolved.	

Order of procedure :—

1. Prepare a thin smear of the material to be examined and allow it to dry in air.
2. Cover the smear with solution 1 and after carefully warming it for a short time over a flame allow the alcohol in the solution to burn off, taking care to keep the smear covered with solution to prevent it from being burned.
3. Rinse in a very weak solution of ammonia (10 to 50 drops to a litre of distilled water).
4. Cover with solution II and warm for a short time—1 to 1½ minutes being sufficient to complete the staining.
5. Flush off, and rinse in distilled water.
6. Dry and examine.

The spirochaetes are well stained and retain their characteristic form. The background is pale yellow and there is no deposit

J. D. T.

Oehler (R.). **Schnellfärbung von Darmflagellaten.** [Quick Staining of Intestinal Flagellates.]—*Deut. Med. Woch.* 1922. Apr. 7. Vol. 48. No. 14. pp. 456–457. With 2 text figs.

Methods recommended to the clinician for diagnostic purposes :—

1. Ruppert's suitable for the finest spirochaetes (*e.g.*, *Spironema pallida*) and for trypanosomes, as well as for intestinal flagellates.

(*a*) For spirochaetes and trypanosomes.

(1) Prepare thin smears on slides of the material to be examined.
(2) Allow the smears to dry thoroughly in air.
(3) Put them for 1–2 minutes into Ruge's fluid (acetic acid 1 part, formalin 20 parts, water 100 parts).

(4) Flush off and wash.
(5) Cover and cook well with saturated solution of "Brillant Reinbleu" 8G. extra (Bayer & Co., Leverkusen).
(6) Flush off and wash.
(7) Counterstain for 3 seconds in five-fold dilution of Ziehl's carbolfuchsin.
(8) Flush off, rinse and dry.

(*b*) For intestinal flagellates, *e.g.*, Trichomonas, the procedure is even simpler—fixing in Ruge's fluid and counterstaining are both omitted.

(1) Mix well the intestinal contents with agar solution (1 part agar to 500 parts water) at body temperature, and prepare smears of the mixture as thin as blood smears. .
(2) Allow the smears to dry in air.
(3) The staining solution (2 gm. "Brillant Reinblue" 8G. extra in 100 cc. water) is now poured over the smear and slightly warmed for 1 minute.
(4) Flush off, rinse, dry and mount in liquid paraffin.

In these preparations, though the form of intestinal parasites is not well shown (pear-shaped Trichomonas, *e.g.*, being too round and flattened) all characteristic parts, sufficient for diagnosis—the nucleus, basal granules, the undulating membrane with its basal line and the fixed flagellum along its free margin, and the three small free flagella —are well shown.

2. Bresslau's—a surface stain, shows the form but not the internal parts. Opalblau, the stain used, is supplied by Grübler as a thick mass. It is well rubbed up with the material to be examined (intestinal contents, pus, etc.), and a fine smear of the mixture is prepared on a slide. The smear is dried by waving the slide in air. All protuberances appear light, all hollows blue in fine gradations so that a clear relief picture on dark-blue background results. The form, the flagella, the ventral depression of Lamblia show up well, and give a good diagnostic picture.

3. Riegel's—a vital stain with Chloroform-azur—is also a help in the diagnosis of intestinal Protozoa.

Manson's stain (medicinal methylene blue (Höchst) 2 pts., borax 5 pts., water 100 pts.) is shaken up with an equal quantity of chloroform. The dark, blue-red chloroform-azur solution is separated from the overlying watery methylene blue layer by pipette and filter, and a drop of this chloroform-azur solution is put on a coverslip to spread out and evaporate. A small drop of the material to be examined is put on a slide and the coverslip with stain film is put on and pressed down, and the preparation examined immediately under the microscope. Bacteria, especially the more active forms, stain purple to violet red forthwith, showing granular inner structure clearly. Then fine and coarser spirochaetes are seen moving about. Active amoebae show bacteria that they have taken up, and vacuoles with material in various stages of digestion. Trichomonas may show large red-stained inclosures; and Octomitus appears blue from the small stained granules in its substance. After five minutes, movement cèases. The staining remains longer, then fades and vanishes.

Two microphotographs accompany the paper. One shows *Trichomonas muris* stained after Ruppert; the other shows *Giardia-Lamblia intestinalis hominis* stained after Bresslau.

J. D. T.

CHIBA (S.). **Die Verwendung der trockenen Hitze bei der Herstellung von Vakzinen (Typhus-, Dysenteriebakterien und Cholera-vibrionen).** [The Use of Dry Heat in the Preparation of Vaccines.] —*Cent. f. Bakt.* 1. Abt. Orig. 1922. Mar. 14. Vol. 88. No. 1. pp. 79–93.

In this paper the author describes and tabulates various experiments which he carried out with one-year-old laboratory strains of *B. typhosus*, *B. dysenteriae* and *V. cholerae* to determine how heat may best be employed in the preparation of vaccines. In an introduction to these experiments he advises that in choosing or comparing vaccines one should bear in mind that (1) there must be no increase of the inoculated virus in the body of the inoculated; (2) there should be the least possible secondary effects; (3) definite protection should be conferred; and in his summary he states that :—

1. In the preparation of antigen, 24 hours' heating in a dry chamber at 55° C. is preferable to 1½ hours' heating in a water bath at 60° C. Using typhoid vaccine prepared both ways there was no difference in the agglutinin and bacteriolysin content produced in the serum of the inoculated animals; while in either case their power to protect, and keeping properties, were practically the same; but toxicity was shown, by experiments on mice, to be less in the case of that prepared by dry heat.

2. Cholera vaccines show no appreciable difference: but the author, under this heading, refers to his having used vaccines prepared by dry heat many times without disadvantage as a point in favour of his method.

3. With dysentery vaccines prepared by dry heat a higher immunity is more quickly produced in rabbits—an advantage in the preparation of dysentery serum for diagnostic purposes.

4. Dry heat is also recommended as being more easily applied. Further experiments with *B. coli* and gonococcus suggest the employment of dry heat in the preparation of other vaccines also.

J. D. T.

i. HARVEY (W. F.) & IYENGAR (K. R. K.). **Virulence of a Micro-Organism and its Dependence on the Culture Medium.**—*Indian Jl. Med. Res.* 1922. Apr. Vol. 9. No. 4. pp. 726–729.

ii. —— & ——. **Virulence of the Organism as a Factor in the Efficacy of Prophylactic Vaccines.**—*Ibid.* pp. 730–735.

iii. —— & ——. **On the Immunizing Properties of Allied Organisms and Non-Specific Organisms.**—*Ibid.* pp. 736–739.

iv. —— & ——. **Retention of Virulence of a Micro-Organism kept in Sealed Culture.**—*Ibid.* Vol. 10. No. 1. pp. 190–191.

v. —— & ——. **The Influence of Age and Temperature on Bacterial Vaccines. Part II.**—*Ibid.* pp. 192–202.

i. This contribution, which the authors have made to the subject of virulence, "relates to experiments on immunity as a result of inoculation, which cover the ground of effect of age and temperature on antigen, the use of avirulent and virulent strains for immunization, rate of loss and rate of gain of virulence by cultivation on artificial media, the effect of immunization with allied organisms and the effect of immunization with wholly non-specific organisms." These are the subject matter of the various researches here grouped together.

The virus used was fowl cholera, and "the strain to which this note refers was originally a virulent fowl cholera (*B. avisepticus*)

which was grown by weekly sub-culture on blood agar and upon ordinary agar for 12 months before being subjected to final test. The growth on blood agar—and this is a point to be noted in connexion with the explanation of virulence—was comparatively luxuriant, while that on ordinary agar was scanty."

[By their parenthesis the authors seem to suggest that their experiments support the view that virulence depends on "a capacity, under given circumstances, of rapid multiplication" rather than on "some inherent property which is not dependent on rate of multiplication."]

The conclusions they arrive at are :—

"1. *B. avisepticus* is an organism whose virulence can be maintained fixed within small limits without animal passage, by sub-culture on blood agar, while its virulence is very largely lost by sub-culture on ordinary agar.

"2. There seems some probability that *B. avisepticus* when sub-cultured on ordinary agar becomes 'fixed' in avirulence."

ii. The virus used was fowl cholera and the experimental animals pigeons. Commenting on their experiments, the results of which are set out in tabular form, the authors point out that :—

"The bacillus of fowl cholera is not one of the organisms which is used in the prophylactic inoculation of human beings. Deductions therefore made from the results here obtained must be based on the argument for analogy when transferred to the case of man and other organisms. The pigeons, too, used in trial, are not immunized in the usual way by subcutaneous inoculation but by intravenous. They are in fact used simply as a means of measurement in life of response to prophylactic antigen and not specially as animals immunized with suitable doses. It is to be noted, however, that the intravenous method of medication used in the trials is not only efficacious, but has not brought about any disturbance of the subjects so far as it is to be gauged by the figures relating to weight."

The conclusions arrived at in regard to the bacillus of fowl cholera, and with reference to the method used in the trials are as follows :—

"1. Protection [is] afforded by prophylactic administration of an avirulent organism to infection by the organism in its virulent condition.

"2. The protection afforded by the avirulent strain bears the proportion in these trials to that afforded by the virulent strain of 9 lives saved out of 15, as against 10 lives saved out of 15. The difference shown between the two is only slight and may or may not be really in favour of the use of the virulent strain.

"3. The response to inoculation of an avirulent strain in the shape of agglutinating power of the serum is the same both for the avirulent and the virulent strain. The same result holds good for the inoculation of a virulent strain."

iii. This research was conducted on exactly the same lines as the last.

"The organisms used were *B. avisepticus*, *B. cuniculisepticus* and *B. coli*, of which the first was the specific organism, the second the group organism, and the third the non-specific organism."

. . . . .

"In this set of experiments with pigeons and with *B. avisepticus* :—

"1. The prophylactic use of the specific organism showed a great saving of life (15 animals out of 15) as compared with a control series in which there was great mortality.

"2. The prophylactic inoculation of an allied organism, *B. cuniculisepticus*, showed no evidence of any greater saving of life than did the prophylactic inoculation of a wholly non-specific organism.

"3. Distinct evidence of protection by the prophylactic inoculation of a non-specific organism has been demonstrated."

iv. The strain of *B. avisepticus* tested was the same as that referred to under i: and as a result of their experiments the authors conclude as follows:—

"The virulence of a virulent culture of fowl cholera is maintained to the full when kept in a sealed tube at room temperature for at least 12 months."

v. In an introduction to their communication the authors mention that in the first paper on this subject by themselves and CHRISTOPHERS, which had reference to typhoid and cholera vaccines, they stated that "protection experiments would have greater cogency than those based on the production of agglutinins," and that "the present paper takes up this more important evidence." They also point out that *B. avisepticus*, which they used throughout this group of researches because it is definitely pathogenic to pigeons, which were easily obtainable in India, had a further advantage in this particular research in that, as a member of the haemorrhagic septicaemia group, it is related to *B. pestis*. They then refer to ROWLAND and STEVENSON's work on the keeping properties of plague antigen and the conclusions they come to, viz.: (1) immunizing power persists for longer periods than toxic power; (2) the protective power of plague antigen increases somewhat after its preparation; (3) hydrolysis of plague antigen can be carried out for some 2½ months at 37° C. without much evidence of reduction of immunizing power.

The methods adopted in the present research are fully explained, tables are given showing the experiments in full, a caution is sounded against hasty generalization, and, keeping strictly within the limits of their experiments, the authors conclude that:—

"A fowl cholera vaccine does not deteriorate in antigenic potency with age or with subjection to the action of any temperature to which it is likely to be exposed, within six or nine months from date of preparation."

In the discussion that precedes the conclusions, the authors say that "at the end of 12 months appreciable deterioration has set in but protective power has not been wholly abolished." They are unable to say from actual trial if this protective power that remains at the end of 12 months is any greater than that which would be produced by a non-specific protein antigen, although the saving appears to be very much of the same order.

J. D. T.

HARVEY (W. F.). **Immunization or Response of Immunized Animals to a Small Dose of Antigen administered at a Long Interval after First Immunization.**—*Indian Jl. Med. Res.* 1922. Apr. Vol. 9. No. 4. pp. 740–746.

The experiments carried out:—

"consisted in the inoculation of 5 pigeons intravenously with the equivalent in suspension of 1 mgm. of dried bacterial typhoid antigen, and the examination of the serum of the pigeons first at 10 days intervals and then at 30 days intervals throughout a period of 12 months for agglutinin titre. At the end of the 12 months a series of doses of antigen ranging from the original dose of 1 mgm. down to 0·01 mgm. were administered intravenously to the 5 pigeons, one dose to each, and their serum tested at intervals of 3 days for the appearance of agglutinins and for agglutinin titre. As controls to the results obtained there were used for similar tests 5 pigeons which had received no antigen at all and 5 pigeons

which, not having previously received any antigen, received the same doses, 1 mgm. to 0·01 mgm., as the immunized pigeons."

. . . . .

"The points which were to be elucidated by experiment were :—

"(1) Whether an animal once immunized remained an animal always differentiated from one which had not been immunized ?

"(2) Whether an animal once immunized was more responsive to the introduction or application of antigen than one which had not been so immunized ?"

As the author points out, "the number of animals used in the experiments here given are much too few to admit of any categorical answer to the questions."

His conclusions, based strictly on the experimentation recorded, are :—

"1. The agglutination effect of intravenous inoculation of typhoid antigen in pigeons shows a diminution month by month after the inoculation. The drop is marked between the 10th and 20th day and very slow thereafter. The condition, so far as a 12 months' trial goes, seems to reach a constant low level, which is, however, higher than that of the uninoculated animal.

"2. The introduction intravenously of a dose of antigen 1/10th to 1/20th smaller than the original dose and even smaller still, calls forth an agglutinin response in the 12 months' previously inoculated pigeons, which is significantly greater than that elicited in uninoculated pigeons receiving the same doses."

J. D. T.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE. 1921. Nov. 17 & Dec. 15. Vol. 15. Nos. 5 & 6. pp. 141–155. With 1 plate.—**Laboratory Meeting.**

Methods demonstrated :—

"Major H. C. BROWN gave a demonstration of the results obtained in a method which, he hoped, would be useful in enriching the number of dysentery organisms in cultures from stools. . . .

"The method of enrichment consisted in adding a small quantity of homologous high titre serum to the mixture of organisms, and then plating out from the deposit after the agglutinated bacteria had had time to settle."

[This method, making use of "the elementary fact that agglutinated organisms are still alive and capable of growth," is much simpler and likely to be more effective than that advocated by CASTELLANI in which the non-pathogenic organisms "are sedimented by homologous sera and the supernatant fluid is plated out."]

"Professor Warrington YORKE and Dr. J. W. S. MACFIE showed :—

"A specimen of urine from a case of paroxysmal haemoglobinuria indistinguishable from that passed during an attack of blackwater fever ; and also specimens of blood from the same case, showing autolysis.

"The autolytic reaction is obtained as follows :—A small quantity of blood is withdrawn and immediately placed upon ice for five minutes, and then in an incubator at 37° C. for one hour. On centrifugalisation the serum is found to be red. No haemolysis occurs if the blood be not placed on ice before putting in the incubator, as the immune body present in the haemoglobinuric blood only unites with the red cells at low temperature. The maximum degree of haemolysis is obtained if the cooling be for from 5 to 7½ minutes ; when the period of cooling is prolonged the degree of haemolysis becomes less and less, until, if the cooling is prolonged for 60 minutes, the degree of haemolysis is only about 10 per cent. of that

obtained when cooling is for 5 minutes only. The explanation of this paradox is complicated and depends on complement splitting.

"Tube 1.—Paroxysmal blood not cooled and put straight into incubator at 37° C. for 60 minutes. Result, no haemolysis.

"Tube 2.—Paroxysmal blood cooled for 5 minutes before putting into incubator for 60 minutes. Result, intense haemolysis.

"Tube 3.—Paroxysmal blood cooled for 1 hour before putting in incubator for 60 minutes. Result, slight haemolysis.

"N.B.—This reaction is not given by blood from blackwater fever patients. . . . . .

"Dr. C. M. WENYON gave a demonstration on a simple culture medium which he had employed for the cultivation of leptospira and protozoa. . . .

"The medium is prepared as follows:—To 270 c.cm. of 0·85 per cent. sodium chloride solution (Ph. 7·6) are added 30 c.cm. of ordinary 2 per cent. bacteriological nutrient agar (Ph. 7·6). When mixture has taken place, 10 c.cm. are placed in each test tube. After autoclaving at 120° C. the tubes are cooled to 50° C., and into each tube are allowed to drop, from a rabbit's ear, 20 drops of blood. The tubes are not shaken nor mixed, and are incubated for twenty-four hours at 37° C. The medium is then ready for use. The blood is obtained from a rabbit by the paraffin method. The animal is enclosed in a box at one end of which is a round opening fitting the neck, through which the head projects. The ear is shaved over the marginal vein. The skin is sterilised with alcoholic iodine solution, and when dry is coated above, below and on the margin with hot melted paraffin, so that the area of operation is covered by a thin layer through which the vein is still visible. With a small sharp knife an incision is made in the marginal vein and the sterile blood allowed to drop from the paraffined margin of the ear into the tubes. After incubation of the blood agar tubes it will often be found that the blood has coagulated in a cylindrical column, leaving a clear agar medium around it."

Dr. Wenyon also referred to an egg medium in which a "culture of *E. intestinalis* was first obtained by Hogue (1921)," and which "has also given good results" in his (Dr. Wenyon's) hands.

"The egg medium is prepared as follows:—Locke's solution is first made; sodium chloride, 1·8 grams; calcium chloride, 0·048 grams; potassium chloride, 0·084 grams; sodium bicarbonate, 0·04 grams; distilled water, 200 c.cm.; to this solution is added one whole egg which has been well whipped. After thoroughly mixing, the solution is steamed for fifteen minutes over the water bath, with constant stirring, and is then filtered through cotton-wool. About 5 c.cm. of the filtrate is then placed in each test tube. After autoclaving at 120° C. the tubes are ready for use."

J. D. T.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE. 1922. Mar. 16 & May 18. Vol. 16. Nos. 1 & 2. pp. 16–24.—**Laboratory Meeting.**

1. The Dreyer and Ward Modification of the Sachs-Georgi Reaction applied to the Diagnosis of Framboesia. [By Lieut.-Colonel H. MARRIAN PERRY.]

"A practical demonstration of the Dreyer-Ward modification of the Sachs-Georgi flocculation reaction (the Sigma Test) was given. Attention was directed to the advantages of the Dreyer-Ward technique, and to the fact that, although originally designed as a diagnostic test of infection by *Spirochæta pallidum* it could be employed with equally reliable results in infection caused by *S. pertenue*.

"Through the kindness of Capt. N. T. WHITEHEAD, Gordon Memorial College, Khartoum, opportunity had recently been afforded of testing the

serum of a series of cases of framboesia by this method; in each serum examined the result was strongly positive.

"The possibility of quantitatively estimating the effects of treatment on the flocculation titre of the serum in any particular case was illustrated by a graph compiled from the results of repeated tests undertaken in a case of secondary syphilis.

"The advantages, under conditions of tropical practice, of a test of this nature, obviating, as it does, the employment of a haemolytic system, is apparent."

[A full account of the Sigma Reaction of DREYER and WARD applied to syphilis is given in "The Practice of Medicine in the Tropics," Vol. 2, pp. 1676–1682; see also *Lancet*, 1921, May 7, p. 956.]

2. Bleaching Powders suitable for Tropical Use.—Demonstration by Major S. ELLIOTT.

"An intimate mixture of 80 parts of bleaching powder and 20 parts of freshly-ignited quicklime forms a dry powder, which is hardly affected by the heat and moisture of a tropical climate. In addition, no rusting of the inside of the tin occurs. Samples sent to West Africa, and stored there under ordinary conditions for six months, showed a loss of only 1 per cent. of available chlorine, and were exhibited together with a tin of ordinary bleach. The latter had been stored in Egypt for six months, and contained less than 0·1 per cent. of available chlorine.

"The United Alkali Co., Ltd., St. Helens, Lancashire, appear to be the only firm manufacturing this 'stabilised bleach' at present."

3. Phenol Red: an Indicator in Culture Media. By Major H. C. BROWN.

"*Phenol Red Milk*:—

"One volume 'Ideal Milk,' four volumes tap water.

"Add sufficient phenol red to make the diluted milk bright yellow.

"Add alkali until mixture is brick-red.

"Tube and steam twenty minutes on three successive days.

"*Phenol Red Sugars*:—

"One per cent. sugars in 2 per cent. peptone solution with phenol red substituted for litmus.

"The advantages of phenol red over litmus as an indicator for milk and sugar media have been fully dealt with by Major BROWN in the *Lancet*, 1922, Vol. 1, p. 842."

4. Agglutination Response following Inoculation of a Polyvalent Vaccine, consisting of *B. typhosus*, *B. paratyphosus* A, B and C.

Major J. A. MANIFOLD and Captain W. W. PRATT, R.A.M.C., having carried out experiments, "with the object of ascertaining whether the agglutinin response to the T.A.B.C. vaccine was satisfactory," conclude:—

"In all cases the agglutination titre of the serum to *B. paratyphosus* C was high, and the response to the T.A.B. antigens unimpaired. The reactions, both local and general, following inoculation with the vaccine, were not more severe than is usual in the case of the ordinary T.A.B. vaccine."

5. A Method of Mounting Fleas for Rapid Identification. (Shown on behalf of Major F. W. CRAGG, I.M.S.)

"A thin layer of Carana [Canada] balsam is spread on a slide and dried overnight in the incubator. The fleas, picked up in forceps and similarly orientated throughout, are laid on the slide in five regular rows of ten fleas per row. A coverslip is moistened with xylol and gently lowered on to the slip. The fleas can be arranged as regularly as a series of sections, and much time is saved in examination."

6. Mass Diagnosis in Ankylostomiasis.

Lieutenant-Colonel Clayton LANE showed a graph illustrating "the area of the microscopic preparation required for a positive diagnosis of ankylostomiasis in (i) the standard West Indian technique, as used in Jamaica during 1919, namely, about 36 sq. in.; (ii) LANE's levitation and KOFOID and BARKER's brine loop technique, namely, 2 sq. in.; (iii) a new technique of LANE's employing complete comminution and centrifugalisation in water following centrifugalisation in salt solution at a specific gravity of 1,200, namely, $\frac{1}{6}$ sq. in. A microscopic preparation showed the great concentration of ova obtained by the new technique from 1 cc. of stool."

J. D. T.

V. GUTFELD (Fritz). **Erste Massnahmen bei Laboratoriumsinfektionen.** [First Measures in Laboratory Infections.]—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Jan. 31. Vol. 87. No. 7–8. pp. 545–553.

This paper deals with the means of aborting infection contracted in the laboratory, or of mitigating its effects. In such the micro-organism concerned and the time of infection are usually known. The infection may be dealt with at the portal of entry during the incubation period, and if and when micro-organisms are excreted. Excretion of micro-organisms may follow infection without intervening illness, and it may not be demonstrable either during or after illness. In this paper the author deals with the destruction of micro-organisms at the portal of entry. He mentions three such portals, viz., the skin, the conjunctival sac, and the gastro-intestinal tract, and discusses measures applicable to each.

Skin lesions should never be sucked; they should be allowed to bleed freely, or, in the case of small lesions which do not bleed, should be cauterized as deeply as possible with tincture of iodine or fuming nitric acid. Infection of the conjunctival sac may entail infection of the nose and intestinal tract. Organisms which act locally only can be killed with fair probability by the instillation of a 1 per mille solution of oxycyanate of mercury several times repeated: the process is chiefly mechanical. The effect may be kept up by introduction of 1 per mille of the same substance in vaseline. If it is important to prevent the organism penetrating into the tear duct, blowing of the nose must be avoided, as thereby fluid is drawn from the conjunctival sac.

The most frequent cause of diseased organisms reaching the alimentary tract is the use of ordinary pipettes. Should infective micro-organisms be drawn into the mouth, the first obvious precaution is to spit into a bowl of sublimate solution, which should always be at hand. The mouth should be washed out repeatedly with 0·2 per cent. HCl or 1 in 4,000 pot. permang., and about 150 cc. of the HCl solution should be drunk immediately and once or twice again in the course of the next hour. The author is against the use of alcohol.

The measures to be taken in the event of infection with the bacilli of enterica, dysentery, cholera, diphtheria, pus organisms and syphilis are then considered in turn. [Undulant fever is not mentioned.]

Enteric bacilli may be introduced through the conjunctival sac, nose, mouth or skin lesions. If the former, the treatment for a mouth infection should be followed as well. A protective inoculation should always be made. If no vaccine is ready there is time to prepare one from the strain concerned, if the preparation is started at once. The subject should be kept under observation for at least two weeks and

the stools and urine should be examined bacteriologically for a longer period. Infection through wounds is extremely rare.

The precautions for dysentery are the same as those for enteric, omitting the prophylactic inoculation.

In the case of cholera vaccination is contra-indicated, for the incubation period is much too short. For the protection of his fellows the subject must be isolated at once. If after five days he is without symptoms and three examinations of the stools have not revealed vibrios all is well. Naturally the same toilet as for typhoid is made at the time of infection. The author gives the following list of the remedies which he thinks should be kept at hand in every laboratory :—

1. A brown litre flask of 1/1,000 oxycyanate solution.
2. A small porcelain or stoneware jar (10 gm.) of 1/1,000 oxycyanate vaseline.
3. A small flask (20 cc.) tincture of iodine.
4. ,, ,, ,, Lugol's solution.
5. ,, ,, (5 cc.) fuming HNO_3.
6. A litre flask of 0·2 per cent. HCl.
7. ,, ,, 1/4,000 pot. permang.
8. Some glass rods and eye pipettes, wrapped in paper to protect from dust.

A. G. B.

VERVOORT (H.). **Over het conserveeren van organen voor het onderzoek op Pest.** [On the Preservation of Organs for Plague Examination.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 2. pp. 224–225.

The following prescription (of BROQUET, *Ann. de l'Inst. Pasteur,* 1910, Vol. 24, p. 890) is recommended for preservation of organs of man or animals for biological plague diagnosis :—

Under aseptic precautions the tissue is put in a bottle of 150–200 cc. capacity, which is filled up with glycerine (neutral) 20 parts, distilled water 80 parts, carbonate of calcium 2 parts, and well corked.

The author kept the organs of a plague guinea-pig for nine days at room temperature, after which he was able to show the plague infection biologically by injecting an emulsion of the organs into another guinea-pig.

W. J. Bais.

SENEVET (G.). **Emploi de l'alun de fer pour le nettoyage des lamelles dévitrifiées.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1921. Sept. Vol. 1. No. 3. p. 337.

Coverslips which have been kept too long in the tropics often become of a milky appearance as the result of partial devitrification ; they are then useless. The author recommends soaking them for a few seconds to several hours in a 3 per cent. solution of iron alum. The two faces are then rubbed with the thumb and index finger moistened with the solution. The more pronounced the opalescence the longer the soaking and the more rubbing required. Dry without washing on a fine linen rag. The author has preparations eight months old made with slips which have been so treated and have suffered no further change.

A. G. B.

WALRAVENS (P.). **Note concernant l'activité alexique du sérum de lapin.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. May. Vol. 1. No. 2. pp. 165–167.

According to the author of this note, the alexic activity of the rabbit's serum is influenced by time quite differently from that of other animals. Its activity, almost negligible at the time of bleeding, increases progressively for several days. After the fourth day it diminishes, and is progressively lost.

J. D. T

UNNA (P. G.). **Das Wesen der Giemsa-Färbung.**—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Apr. 13. Vol. 88. No. 2. pp. 159–164.

This is a highly technical paper dealing with the chemistry of the characteristic nuclear staining element in Romanowsky stains known by Nocht's term "Rot aus Methylenblau." The author discusses its derivation from methylene blue, and the synthesis of methylene blue itself.

J. D. T.

WORDLEY (E.). **Further Results on the Isolation of Organisms from Faeces by a New Method.**—*Jl. of Hyg.* 1921. Dec. Vol. 20. No. 4. pp. 360–362.

The author has already described this method [see this *Bulletin*, Vol. 19, p. 84.]

It is stated to have been found constantly superior to all others in isolating organisms both from faeces and from sputum.

A. A.

SPRUE.

ASHFORD (Bailey K.). **Observations on the Conception that Sprue is a Mycosis superimposed upon a State of Deficiency in Certain Essential Food Elements.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Mar. Vol. 2. No. 2. pp. 139–150.

In this paper Ashford summarizes his experience of sprue in Porto Rico; from 1908 up to the end of 1921 he has studied over 1,000 cases.

His main contention is that sprue is a mycosis superimposed upon a food deficiency and that the pathogenic agent is *Monilia psilosis*; an organism claimed to be quite distinct from *Monilia albicans*. His conviction is so sincere that he is led to remark, if *Monilia psilosis* is not the direct cause of tropical sprue why should *Monilia albicans* be considered the cause of thrush? Typical sprue is most frequently preceded by a physiologic glandular deficiency recognizable by a deficiency syndrome in which pallor, lassitude and gastro-intestinal derangement are prominent symptoms. In this condition, he thinks, there is a marked reduction in the output of the digestive glands, particularly of the pancreas and intestinal glands, resulting in a change in the composition of the intestinal contents which become highly acid. Here the pathogenic agent—*Monilia psilosis*—finds a congenial medium in which it can multiply and produce the typical disease, sprue. The same train of events seems to occur in thrush, the cause of which is universally recognized as *Monilia albicans*. The latter is a disease of infants and old people suffering from marasmus or avitaminosis. In this condition rapid proliferation with membrane formation occurs on the tongue and primae viae.

When one considers the claim to specific rank which *Monilia psilosis* holds and the frequency and consistency with which overwhelming infections of active cases of sprue with this organism occur and the mass of laboratory, clinical and epidemiological evidence, the conclusion is almost inevitable that *M. psilosis* is the cause of the disease.

P. H. Manson-Bahr.

FISCHER (Walther) & VON HECKER. **Beitrag zur Kenntnis der Sprue.** [Contributions to the Knowledge of Sprue.]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1922. Mar. 28. Vol. 237. No. 3. pp. 417–448.

This paper is based upon elaborate histo-pathological studies of a fatal case of sprue in Bonn. The man had lived for many years in China. Since 1902 he had suffered from a more or less chronic dysentery, and true sprue symptoms began in March, 1919, in Sumatra. He died in August, 1921.

At autopsy the main interest centred in the intestinal canal. In the mucosa of the lower jejunum and in three places in the ileum small ulcers of linseed-size were found. They were of considerable depth, penetrating to the longitudinal muscular coat; their margins were rolled, not undermined. In the caecum were found 20 dark red or greyish patches in the mucosa, and there also the gut wall was attenuated. Sections of the ulcers revealed little of note; the superficial epithelium was entirely lacking and the ulcerations extended into the circular muscular coat; their base was formed of granulation tissue with fibroblasts, lymphocytes, plasma cells and sparse eosinophiles. The underlying muscular fibres were heavily pigmented. The stroma at the edge of the ulcers was packed with eosinophiles, while

the submucosa was oedematous. No micro-organisms were visible in the tissues. It is interesting to note that similar ulcers in the same situation have been recorded. The atrophy of the gut—the so-called "psilosis"—would appear to be an artefact, a product of post-mortem decomposition; it should be regarded as a secondary phenomenon, due to the chronic distension of the bowel wall with gas, and not directly connected with the primary sprue process. The microscopic appearances of the pancreas were normal. The liver presented a picture of brown atrophy, a condition apparently customary in sprue, a considerable haemosiderosis is present, and, on the other hand, few signs of fatty degeneration. Changes in the bone marrow resembled to a certain extent those of pernicious anaemia—such as, a well-marked haemosiderosis, an excess of eosinophilic myelocytes. A marked haemosiderosis was present in most organs (especially liver, spleen and mesenteric glands), and may be significant of the magnitude of the blood destruction in this disease. The blood picture was that of a severe anaemia (red cells 2,200,000; hyperchromasia colour-index 1·3); there was moderate poikilocytosis, and a normal leucocyte count. Arneth index estimation showed a "shifting of the index to the right."

A *haemochromatosis* of the bowel is present as well. This pigment differs from haemosiderin; it is present in the muscular coats, as well as in the mucosa and submucosa; it is of fatty nature, insoluble in acids, and is bleached by bleaching reagents, such as hydrogen peroxide and stains feebly with Sudan III; it is probably lipofuscin, and may be indicative of a localized lesion of the intestine. Careful search of the intestinal lesions failed to demonstrate any yeast cells or mycelium, and the authors conclude that when present they represent merely a secondary invasion. In conclusion the opinion is expressed that very intimate association exists between amoebic dysentery and sprue; the geographical distribution of sprue corresponds in a remarkable manner with that of severe amoebiasis, and clinical experience has shown that amoebic dysentery is an almost invariable precursor of sprue.

P. H. M-B.

GOLDSMID (J. Albert). **A Case of Sprue in New South Wales.**—*Med. Jl. Australia.* 1922. June 10. 9th Year. Vol. 1. No. 23. pp. 636–637.

The case here reported is undoubtedly one of sprue in the early stages, the author being convinced that sprue, as well as ankylostomiasis occurs in New South Wales, and as to the latter assertion he has already proved himself to be correct. This is the first instance of sprue he has seen during 25 years' practice on the Tweed River. The patient is a lady, 25 years of age, who complains mainly of soreness of the right side of the tongue; she suffers from epigastric tenderness, passes typical diarrhoeic stools, and has lost 10 lb. in weight during a month.

P. H. M-B.

CASTELLANI (Aldo) & BROWNING (K. C.). **An Ethereal Extract of Strawberries for the Treatment of Sprue.**—*Brit. Med. Jl.* 1922. May 6. p. 718. With 1 fig. in text.

The favourable influence of a strawberry diet on sprue and the difficulty in procuring suitable berries out of season led to attempts

to isolate an extract from this fruit, based upon the experiments of ZILVA on the alcoholic extraction of antiscorbutic and antineuritic principles from cabbages and carrots. Fresh strawberries were crushed with 5 per cent. of their weight of absolute alcohol and filtered in a powerful filter press; the juice was then extracted for days in a continuous ether extraction apparatus. The ethereal extract was immediately concentrated in a vacuum over phosphorus pentoxide, a small quantity of either starch or lactose being added. The residue was dried as completely as possible in a vacuum over phosphorus pentoxide. The extract mixed with starch is of a dark red colour, has a granular scale-like appearance, and bears a fragrant smell of fresh strawberries. Clinical investigation has been so far limited, but when tried with usual milk diet and alkaline treatment in 5 gr. doses three or four times a day it seemed to have a beneficial effect. [Such an extract is prepared by Messrs. Martindale, see p. iii of the advertisements.]

P. H. M-B.

ASHFORD (Bailey K.). **La carencia de ciertos elementos alimenticios como causa predisponente del espru, pelagra y beriberi en Puerto Rico.** *-Bol. Asoc. Med. Puerto Rico.* 1921. Dec. 31. Vol. 15. No. 134. pp. 249–259.

MISCELLANEOUS.

BONREPAUX. **Fonctionnement du Centre d'Orthopédie de l'A.O.F.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1921. July & Aug.–Sept.–Oct. Vol. 3. Nos. 17 & 18. pp. 117–121; 125–129.

The Orthopaedic Centre of Dakar, French West Africa, was established in 1918 to supply apparatus, and teach its use, to native soldiers mutilated in the war. Expert hospital treatment was available, but the most difficult matter was to organize proper supervision of those who had returned to their homes in far distant villages; and to improvise from stores of appliances and spare parts devised for white soldiers in France, the simpler apparatus that alone could be of permanent use under semi-civilized conditions. Whilst craftsmanship is available locally, so far very little success has attended efforts to utilize the indigenous woods, though experiments are being made. Leather, too, produced in the colony is insufficiently tanned.

The work has progressed so satisfactorily that in 1921 more than 2,000 amputees were under supervision in the colony. Of this number a third were cases of partial amputation of the foot, and the results from the orthopaedic point of view were no more satisfactory than those in other parts of the world. Neither CHOPART nor LISFRANC were primarily concerned, as surgeons should be nowadays, with the physiological value of the part remaining. Hence many of the stumps at Dakar have had to be, as the author diplomatically says, "retouchés" by the surgeon.

"Parade" arms, often enough discarded by amputees even in cities, are altogether out of place in the wilds, and elaborate appliances for the lower limb are generally not durable enough for the climatic conditions. As a rule a simple rigid pylon is most satisfactory to the patient, and, if articulated, serves every purpose. Cases of Chopart, Lisfranc and Pirogoff amputations in sandy country are best fitted with "elephant" boots. The moral of the article is that an "African" prosthesis should be extremely simple, comfortable, strong, stable, safe, made of very resistant materials, and easily replaced.

E. Rock Carling.

VAN LOON (F. H.). **An Investigation into Mental Fatigue with Batavia School Children.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Part I. pp. 25–46. With 5 charts.

The writer states that, for some years, educationists in Java have feared lest, in tropical countries, the customary hours of school may be too long, and may even be causing grave over-pressure in the children. Enquiries and circulars addressed to teachers on this subject have, however, led to dubious or inconsistent results. Dr. Van Loon, therefore, has endeavoured to investigate the problem by the objective methods of experimental psychology.

He has chosen for his experiments WIERSMA's method of measuring fatigue—the cancellation of a given group of dots (say, all groups of four) from a page containing numerous groups of three, four and five. His chief conclusions are as follows:—

Serious symptoms of over-pressure were nowhere found. The children of Batavia show practically no greater fatigue than the

European children tested by the same method in Groningen. His main results, however, are obtained with older children; and he considers that in the tropics the five-hour day is probably too long for children under seven. Girls, he finds, show if anything less fatigue with this test than boys. The Eurasians appear to fatigue less easily than the natives. Holidays prove most refreshing to those children who can spend their vacations in the hills. Where a holiday means simply lessened regularity of living—of hours of sleep, meals and occupation—it may prove detrimental. Fatigue was least in agricultural and technical schools, where practical and theoretical instruction is given alternately. It was greatest with nervous and delicate children. The investigator adds that it would be instructive to "repeat the experiments with children suffering from chronic malaria, and from the under-feeding so commonly found in many schools in tropical countries."

[These conclusions are quite consonant with the more recent findings of experimental psychology in other countries. It is, however, to be observed that further enquiry often shows that fatigue is not necessarily non-existent where the test employed fails to reveal it; and, further, many psychologists would not agree that the test selected was the most effective for the purpose.]

Cyril Burt.

LE DANTEC. **Traitement opératoire des grands éléphantiasis du scrotum.** —*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1919. May. Vol. 1. No. 1. pp. 16–21.

The author, who is Director of the School of Medicine of French West Africa, at Dakar, states that elephantiasis of the scrotum is common in that colony, and that when, as the result of successful surgical intervention in one or two cases, a hospital has acquired a reputation, sufferers from this infirmity come in from far and wide to claim relief. It is consequently very desirable to increase the number of centres where such relief can be obtained, and, as a first step in this direction, he rightly thinks it necessary that medical men should realize that removal of even the largest elephantoid tumour of the scrotum is quite a simple procedure. With this end in view, and without laying any claim to originality, the author proceeds to describe the method and technique practised by himself and recommended in their general lines for adoption by others.

Stated briefly, his method differs from those more usually favoured in the fact that the use of the elastic tourniquet is dispensed with, and that the first incision is a median one whereby, after liberation of the penis, the tumour is divided into two lobes, which are dealt with separately. This incision commences at a point midway between the symphysis pubis and the preputial orifice, surrounds that opening, and continues along the median raphé of the scrotum until healthy skin is reached in the perineal region. The upper part of the incision is then deepened and the penis liberated, the inner lining of the prepuce being preserved. The lower portion of the incision is then continued deeply along its whole length between the testes, and the tumour with a few touches of the knife, almost by a process of cleavage, is divided into two lobes. The testes are then in turn liberated from the loose blubbery tissue in which they are imbedded, the operator working in each case from the inner side. If hydroceles are present the sacs are excised. The cords are followed upwards and freed as far as the

external abdominal rings. Testes, cords and penis are raised and placed in a position of safety upon the abdominal wall. The lobes of the tumour are then amputated, separation being effected from within outwards until the skin is reached, a method which permits of recognition of the larger vessels and their division between haemostats without loss of blood. These larger vessels are usually few in number, and those of smaller size are easily dealt with subsequently. The lines of skin division will, as in other operations for elephantiasis of the scrotum, vary with the amount of healthy integument available, and if flaps can be formed to provide covering for the testes they are not necessarily symmetrical. The penis is enveloped in a flap raised from the skin below the pubis and stitched by its lower margin to the reflected preputial lining.

From this procedure the author claims satisfactory results, both immediate and ultimate. Haemorrhage is reduced to a minimum, and the bulk of the tumour, by its division into lobes, ceases in the case of the larger growths to be an obstacle to rapid performance of the operation, even in the absence of more than one available assistant He regards the method as a simple one, capable of being carried out by any operator, and well suited to the generality of cases, though not necessarily always the best.

[The procedure is not altogether new, as indeed the author points out, having previously on occasion been applied in part to tumours of moderate size with no implication of the penis ; perusal of the paper in the original will convince most surgeons that the suggested extension of its scope is justified.]

J. J. Pratt.

CHATTERJI (K. K.). **Radical Cure of Hydrocele by Plication and Overlapping of Tunica Vaginalis with Statistics of 225 Cases.**—*Indian Med. Gaz.* 1921. June. Vol. 56. No. 6. pp. 209–210. With 1 text fig.

The author is of opinion that both the method of excision and that of eversion of the sac disregard the lessons of nature, which rather suggest cure by adhesion.

The operation for procuring adhesion is fully described and figured. The essentials of it are after exposing the sac, to carry a full length incision through it. After roughening both its visceral and parietal layers one half of the sac is drawn across the testicle, lying *in situ*, and fixed by sutures along the line of reflexion of the tunica vaginalis ; and then the same thing is done with the other half, allowing it to cover and overlap the first half. If the sac be large it can be folded in pleats ; if very large the unrequired redundancy can be cut off. Two hundred and twenty-five cases are all returned as cured.

A. Alcock.

JOUVEAU-DUBREUIL. **La variolisation au Setchouan.**—*Bull. Méd. Franco-Chinois.* Pekin. 1921. Aug.–Dec. Vol. 1. Nos. 3 & 4. pp. 139–142.

The author tells us that under the Sung dynasty in A.D. 1022 the prime minister, Ouang Tan, having lost several sons from smallpox, and having learned that preventive inoculations were practised on a neighbouring hill, had a son inoculated who escaped the disease, whereby the method became speedily popularized.

To the Chinese smallpox is a natural phenomenon, the expulsion of the impurities which have accumulated during intra-uterine life ;

this expulsion is essential, should take place as early as possible, and is provoked by variolization. Dried crusts are taken from inoculated children who have had a mild attack. They are kept in a cool place, during the hot weather in the hills. The crusts are either broken up with a little milk or water and introduced into the nostril on a tampon which is left in place for 12 hours, or powdered, in which case the powder is blown into the nose by means of a hollow bamboo or the rachis of a goose feather. Medicine is given on stated days and the diet is carefully controlled, so that the operation is costly. Another method has been introduced since the coming of European vaccination. Crusts are collected from vaccinated children, preserved dry, and used suspended in water or milk either by the nose or by small scarifications of the arms. Notwithstanding these methods and vaccination, smallpox is common. Of 535 persons taken haphazard 61 had pocks on the face, or a proportion of 11·4 per cent. Inquiry showed that of 200 persons 93 were inoculated or vaccinated between one and five years of age, and 68 between five and ten, and this delay helps to keep the disease endemic. Vaccination is done only in certain months and many days of these are unlucky. Leap years are unfavourable. Owing to the hypothesis of the nature of the disease the process is never repeated. There seems to be no recognition in China of the contagiousness of smallpox.

A. G. B.

BAUS. **Note contributive à l'étude des flèches au strophantus (Haut Dahomey).**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1919. Oct. Vol. 1. No. 3. pp. 34–37; and 1920. Mar. Vol. 2. No. 3. pp. 74–80.

During the military operations in Borgu and Atakora, Upper Dahomey, in 1916–17, the author had occasion to study 92 cases of wounds by arrows poisoned with *Strophanthus hispidus* used by the Baribas tribe. The arrows are slender reeds, 40–60 cm. long, ending in iron heads of various shapes. These are, we are informed, made by the native smiths from Government telegraph wire. The quivers, of goat skin, hold 15 to 200 arrows and contain the solution of Strophanthus to a depth of 10 centimetres, described as blackish and of tarry consistency; in this the arrow heads rest. Between the receipt of the wound and the onset of symptoms is a period varying between ten minutes and one and a half hours, commonly about one hour. Prodromal signs are muscular weakness, which is felt in the less severe cases after about half an hour, and irregularity of pulse. The symptoms in fatal cases are detailed: the chief are tremors, clonic convulsions, and dyspnoea, each of rhythmical recurrence. Of the 92, 37 survived; in them the convulsion stage was never reached The basis of treatment was tannin, which the author found experimentally never to fail, but its efficacy depends on the rapidity with which it is brought into use. After failures due to a delay of a few minutes the most exposed of the native troops were provided with saturated tannin solution in quinine-tablet flasks. The author does not approve of removal of the arrow by counter incision, on the ground that it exposes more tissue to the poison. He cuts down on the arrow head and applies the tannin solution, or the patient does this immediately after tearing the arrow out. He doubts the value of ligating a limb. Nothing is said of the way in which the natives prepare the poison.

A. G. B.

LOUYS (G.). **La dépopulation dans la basse Côte d'Ivoire. Campagne médicale.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. July & Oct. Vol. 2. Nos. 7 & 8. pp. 207–212; 241–247.

The author has made a study of the causes of the decline in population in the Lower Ivory Coast and suggests remedies. One is struck, he remarks, by the small number of children and their ailing and stunted appearance. The villages contain crumbling houses with masses of debris, where formerly there were habitations. Clearings have been abandoned for want of hands to cultivate them and have relapsed to jungle. In the midst of plenty of exploitable products the people perish. On his tours he has collected figures of birth-rates, infantile mortality and still-births, which he gives in tabular form. Of 569 "young" women who were interrogated, 242 had borne one child only and in 63 instances this was dead. The proportion of children to 100 women was 87·5. He classifies the factors which reduce the vitality of a race as social—induced abortion and alcoholism—and medical—faulty hygiene and disease. The chief causes in Dahomey are alcoholism, due not to trade spirit but to palm wine, and syphilis. Malaria is not an important factor. The author says that all the malarial attacks which he has seen in natives have been in persons long in contact with Europeans, and that if the native child is the chief reservoir the European is the chief agent of spread (*colporteur*).

Syphilis is believed to affect largely the infantile mortality. Among the children that survive signs of congenital syphilis are common—enlargement of liver and spleen, bony changes, dental irregularities, old iritis lesions, and large ulcers which disappear with antisyphilitic treatment. Primary sores are often masked by phagedena, secondary ulcers by dermatomycoses.

In the last part of the paper is described a medical campaign, the object of which is to draw up a complete inventory of native morbidity, with vaccination and revaccination of all, ascertainment of the malarial index with the necessary measures of prevention, the discovery of tuberculosis cases, the discovery and isolation of persons infected with leprosy and sleeping sickness, the discovery and treatment of syphilis. Permanent records are to be made of all the inhabitants of each village, and it is calculated that 1,600 persons can be thus examined per month or, with trained personnel, 2,000. [One may take leave to doubt whether there are enough medical officers in these vast primitive countries to put such a scheme into execution.]

A. G. B.

BAUJEAN. **Phlegmons à pneumocoques avec réactions articulaires simulant le rhumatisme.** *Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. July. Vol. 2. No. 7. pp. 186–187.

A native soldier was admitted to hospital for "acute rheumatism." There was great swelling of the shoulder, elbow and knee on the right side, with much pain and high fever. The swelling affected the thigh as well, where was a chain of painful glands. There was cough and congestion at both bases. Salicylate had no effect, and a fortnight later the state was unchanged save that the arm was swollen. Later there were signs of suppuration here, and pus was let out containing pneumococci. Puncture of the knee joint brought away cloudy

serum with red cells and pneumococci. Later an abscess was opened above the knee, also containing the pneumococcus. Ultimately the patient succumbed.

A. G. B.

DE LANGEN (C. D.). **Het uitzenden der buitenlandsche artsem en de onde en nieuwe salaris regeling bij den burgerlijken geneeskundigen dienst in Nederlandsch Indië.** [Alien Physicians for Dutch East Indies. Comparison between the Old and New Salary Regulations.]—*Nederl. Tijdschr. v. Geneesk.* 1921. June 4. Vol. 65. (1st Half-year.) No. 23. pp. 3064–3072.

As there was a great shortage of officers in the medical and public health service in the Dutch East Indies and as there were practically no applicants from the members of the profession in Holland, this led the Government to appoint 50 alien physicians, who had not Dutch qualifications. This naturally gave rise to many protests. Consequently the salaries for these services were considerably increased and only those with Dutch qualifications are to be accepted.

T. Joekes.

JOUENNE. **Sur le fonctionnement de la Polyclinique de l'Hôpital Indigène, depuis sa fondation en 1918, jusqu'au ler janvier 1920.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1921. Apr. Vol. 3. No. 14. pp. 60–69.

The Polyclinic of the Native Hospital at Dakar was founded in 1918 at the same time as the Medical School [see this *Bulletin*, Vol. 17, p. 218]. It has been progressively successful and was visited in 1920 by 2,621 patients. Here the native students of medicine and midwifery get their instruction and learn to keep records on a system which is described at some length.

In the two years under review *syphilis* has been the most prevalent disease. The author hopes to banish it by the medical supervision and thorough treatment of prostitutes. Typical chancres are rare, they are nearly always phagedenic, and the secondaries are often severe. *Tuberculosis* comes next in frequency. The soil is virgin and the disease is spreading in the bush as well as the town. It has been favoured by the influenza epidemic as well as the recent high cost of living. The average number of people in one room is three, and the bachelors live under still more crowded conditions. The author thinks that in the combating of this and other infectious diseases we are tender to the individual at the expense of the race. All forms are found and the disease becomes readily generalized.

Another common complaint is *uterine inflammation*, attributable to the frequency of gonorrhoea and puerperal sepsis. Uterine prolapse, the result of perineal tears and vesicovaginal fistula, is far from rare. In the bush these cases are rarely seen, but at the clinic, in consequence of the examinations being made by the female students, it is easy for the doctor to use the speculum and give the necessary treatment. Menstrual troubles are a frequent source of complaint. The knowledge of these affections among native women is due to the midwife pupils; formerly there was no such thing at Dakar as gynaecological practice. Operations on women at the Native Hospital are now becoming more frequent: in 1917 there were only 3, in 1920, 37.

Vincent's stomatitis at its classical site behind the last molar is common; the fusiform-spirillary association is usually found. Local

treatment with novarsenobenzol is effective. Many cases of *epulis* have been seen. The *tumours* seen so far have been primary cancer of the liver and bony tumours of the lower maxilla. *Ankylostomiasis, vesical* and *rectal bilharziasis* and *haematochyluria* are common. The great relative frequency of *mycetoma* with red and black grains is noted. Many such cases are sent to hospital with the diagnosis of tertiary syphilis or chronic osteitis. It occurs in various parts of the body, and appears to have its origin outside Dakar.

A. G. B.

BAUS. **Note sur un cas de rupture de la rate, nécropsie.** -*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1921. Jan.–Feb. Vol. 3. No. 11–12. pp. 12–13.

A native, in a quarrel, gave his adversary some violent blows, then put his hand on his left side, tottered, fell and died in a few minutes. He himself received no blow. The spleen, which was enlarged to 700 gm., had three rents and the peritoneal cavity was flooded with blood. The liver was cirrhosed. It was surmised that the violent muscular contractions caused sudden compression of the spleen.

A. G. B.

SEN (D. N.). **Addendum to Auto-Haemic or Auto-Serum Therapy.**—*Indian Med. Gaz.* 1921. Sept. Vol. 56. No. 9. pp. 326–328.

The author's methods of "auto-haemic" therapy [see this *Bulletin*, Vol. 18, p. 141] are here more fully described. The ordinary serum, or the defibrinated blood, or the haemolysed blood of the patient may be used—in every case, of course, under strict aseptic conditions throughout.

In the process of haemolysis 0·5 cc. of blood is well mixed with 10 cc. of fresh-sterilized distilled water and the mixture is incubated (a thermos flask will serve in the absence of an incubator) for 24 hours at 42° C.; the supernatant fluid, after its asepsy is verified, is used for injection, beginning with a dose of 1 cc., and increasing the several successive doses by 1 cc. up to a maximum of 5 cc.

The serum is used in the same dosage; but for the defibrinated blood—which of course must be filtered before use if injected intravenously—the doses are double.

Instead of ordinary blood-serum, serum may be obtained by blistering the patient, or if there be ascitic or pleuritic fluid, they may be used.

"The consensus of opinion is that the auto-haemic treatment has been well tested in functional and metabolic disorders and has proved of much value; whereas in bacterial diseases how far it is efficacious has not yet been fully determined."

A. A.

NEWHAM (H. B.) & DUNCAN (J. T.). **A Note on the Arneth Count in Malaria and Dysentery.**—*Jl. Trop. Med. & Hyg.* 1921. Dec. 1. Vol. 24. No. 23. pp. 301–303. With 10 charts.

Seeing that authorities do not agree on the normal Arneth count, the authors selected six apparently healthy men and each counted the lobes of 100 neutrophile cells from each subject, taking the mean of the two figures so obtained. The normal count came out between 240 and 260 (Arneth's was 276). They then made daily counts, omitting Sundays, on five cases of benign tertian and one of subtertian

malaria, all with parasites in the blood, and four cases of amoebic dysentery, and show the results in a series of charts. In all the malarial cases the initial count was low and the final count higher, in three within the normal limits (9 to 19 counts); the change tallied with the administration of quinine, that is, there was an initial shift to the left. In the amoebic dysentery cases there was no appreciable deviation from the normal at the outset and consequently in the later counts no appreciable change.

A. G. B.

REIS (Ascanio Paiva). **O indice normal de Arneth em S. Paulo.**—*Brazil Medico.* 1921. Sept. 24. Year 35. Vol. 2. No. 11. pp. 147–149.

The author's blood examinations, with a view to determining the normal index of Arneth in S. Paulo, were made on 50 apparently healthy persons of both sexes. Grouping the leucocytes into five classes, according to the number of their nuclear segments, group V comprising those with five "nuclei" or more, the following percentage formula was arrived at on averaging the 50 results :—

I	II	III	IV	V
5	26	44	21	4

Adding together classes I and II and half of class III the index figure 53 is obtained.

F. S. Arnold.

DRY (F. W.). **Trypanosomiasis in the Absence of Tsetses, and a Human Disease possibly carried by *Simulium* in Kenya Colony.**—*Bull. Entom. Res.* 1921. Nov. Vol. 12. Pt. 3. pp. 233–238. With 2 plates.

The human disease which is the subject of the second part of this paper is of a vague description, as regards history as well as symptoms. The author saw 23 cases. The chief symptom is that "the skin is in folds," appearing first on the small of the back, and occasionally extending to other parts of the trunk and in elderly people to the arms and legs. There are sometimes "spots" and always pruritus. Some seemed to be in a feeble condition. Some claimed to have been sufferers for 30 years. The Lumbwa are convinced that the affection is caused by the bites of Simulium, called by them "kekonjek," but only after prolonged subjection to their attacks. Cases are said not to occur except in the vicinity of forest infested by the fly, but a Kisii "elder" who had both folds and spots had never lived in infested country. Whereas eight adults living in a clearing in infested forest all had the disease, a number of children who had never left the spot were free. Blood slides obtained from three Lumbwa men, who were old sufferers, showed about 20 per cent. eosinophilia.

These are all the essential data. The photograph of the back of a native shows what might be scars or crusts on the lumbo-sacral region and buttocks, and the skin there thrown into transverse folds across the spinous processes. The incriminated fly is *Simulium neavei*, Roubaud. It inhabits dense well-watered thorn forest at about 6,000 feet, and to a less extent thin forest. It bites very readily and often raises half-inch wheals.

A. G. B.

THOMSON (Joseph Oscar). **Urinary Calculus at the Canton Hospital, Canton, China, based upon Three Thousand Five Hundred Operations.**—*Nat. Med. Jl. China.* 1921. Sept. Vol. 7. No. 3. pp. 136–158. With 3 text figs.

As the title indicates, this paper contains a wealth of information, chiefly statistical. Lithotomy was done for the first time in Canton in the year 1844, and in the last nine years of these statistics the annual average of urinary calculi was 62 cases. The etiology is discussed but no certain conclusions are reached. Surgeons in the tropics to whose lot it falls to operate for stone should study Dr. Thomson's paper.

A. G. B.

HENRY. **Traitement du pian-bois et du granulome vénérien par le tartre stibie.**—*Rev. Méd. et Hyg. Trop.* 1921. Vol. 13. No. 3. pp. 79–82.

The author at Cayenne, French Guiana, has treated eight cases of forest-yaws and four of granuloma venereum with tartar emetic. Details of one of each class of case are given; all were cured. He employs a 1 per cent. solution in physiological saline candle-filtered. 10 cc. are given intravenously every day till recovery is complete, that is, for 15–25 days. A local application of the same solution was attempted but caused insupportable pain. If the forest-yaw is large, it is first excised.

A. G. B.

NICOLAS (J.) & FAVRE (M.). **Traitement radiothérapique de la lymphogranulomatose inguinale subaiguë.**—*C.R. Soc. Biol.* 1921. July 23. Vol. 85. No. 27. pp. 472–473.

This lymphogranulomatosis, beginning with a small herpetiform ulceration of the genitalia, gradually involves all the inguinal glands until the groin becomes an indurated mass of fistulous suppuration. Radiotherapy has been found efficacious, particularly when the skin is still unbroken, but when fistulae have formed it has to be supplemented by surgery.

A. A.

COX (H. V. W.). **A Unique Instance of Lead Intoxication.**—*Indian Med. Gaz.* 1921. July. Vol. 56. No. 7. pp. 257–258.

It is a custom among long-term convicts in Indian jails to fashion a pouch in the upper part of the oesophagus by means of a leaden disk slung from the teeth and kept hanging in the gullet. How long the pouch (which is meant for hiding coins and other prohibited articles) takes to form is not known.

In the present case a prisoner suffered severely from chronic dyspepsia, constipation, and various muscle-pains, aches and nervous troubles, which baffled diagnosis until he confessed to having swallowed a leaden disk about 18 months before. Before he could be X-rayed he died. At the post-mortem an oxidized and superficially eroded disk was found in the stomach. In the array of symptoms paralysis and colic were not present.

A. A.

REVIEWS AND NOTICES.

MACPHERSON (W. G.), HERRINGHAM (W. P.), ELLIOTT (T. R.) & BALFOUR (A.). [Edited by.] **History of the Great War Based on Official Documents. Medical Services. Diseases of the War. Vol. 1.** pp. viii + 550. With 6 plates & various text figs. & charts. 1922. London: H.M. Stationery Office. [Price £1 1*s*. net.]

It is not consistent with the principles of this *Bulletin* to notice a volume of this class in its entirety, so that if we concentrate our attention on the chapters that relate to what we must continue to call—while the inhabitants of tropical countries remain so careless of the preservation of life, and so long also as we are at pains to define our terms—"tropical disease," we trust to be absolved from any want of appreciation of a work of enormous historic interest and of very high scientific and literary merit.

At the outset, however, it is legitimate to take thought upon some great lessons, to be found in the introductory chapter on "General Aspects of Disease during the War," which indeed are lessons for the whole profession and might be underlined in *any* medical journal.

The first of these lessons, based on local statistics exactly recorded, is "the immense effect of uncleanliness in the production of disease"; from these statistics we learn that the result may be "a sick rate from dirt diseases which amounts to nearly 50 per cent. of the total sickness of an army."

The second lesson, the texts of which are supplied by gas-gangrene, gas-poisoning, trench fever, etc., is the great usefulness of original research even when conducted under difficulties in the field.

The third lesson—as apt in peace as in war, and particularly apposite in tropical territories—is that the voice of the medical authority at the inner council-table is one of the essential factors of a successful State project.

The fourth lesson, taught like the last by the medical services in the war, is that the fullest knowledge of everything that tends to prevent disease is consistent with the highest skill and humanity in the treatment of patients.

Two other lessons may suggest themselves to the readers of some of the most important chapters of the book: the one is the ever-present moral of the insect, the other is that it almost needs a war to drive home the utilitarian value of pure biology and pathology.

The diseases included in this volume are enteric fevers, dysentery, cholera, typhus fever, cerebrospinal fever, influenza, bronchitis and broncho-pneumonia, malaria, blackwater fever, trypanosomiasis, relapsing fevers, phlebotomus fever, trench fever, jaundice, scurvy, beriberi, famine dropsy, pellagra, nephritis, and cardio-vascular disorders. All the articles are fashioned on a uniform plan; in the case of each disease the author, or authors, start with a general historic survey of its incidence and effects in armies, and then follow on with all the considered experience of the Great War upon its etiology, morbid anatomy, symptoms and complications, prognosis, both for the individual and from the army standpoint, diagnosis, treatment and prevention. So that the work promises to be not only part of the history of the war but also a lasting part of the history of medicine, not only a textbook for the army medical officer but also a book of great assistance to the civilian.

Limiting our attention to the chapters on diseases that specially beset the tropics, we may take, to begin with, the admirable chapter on dysentery, of the two chief forms of which there occurred during three years, 1916–18, on all six fronts collectively, over 84,000 cases. The copious experience of the medical officers of the army must therefore be interesting.

Bacillary Dysentery, besides its part in the tragedy of Gallipoli, was present on all the fronts, and in East Africa, in 1917, accounted for 486·5 of all admissions per thousand of strength. For exquisite diagnosis a

fresh stool—best of all a swab from the rectum obtained by the pathologist himself—is necessary, but for practical purposes a sufficiently accurate judgment can be made on a microscopic examination of the cell exudate —an exudate of 90 per cent. undamaged polymorphonuclears.

The routine treatment recommended in the acute stage is castor oil and opium, followed next day and afterwards by sodium sulphate until the stools become feculent; with cocaine suppositories for tenesmus and dysuria. The value of antidysenteric serum is discussed; its chief weakness is deficiency in anti-Shiga immune bodies: the general opinion of it was favourable, but that it predisposes to arthritis; the author doubts that it is of any value if the mucous membrane has become necrosed. The fallacy of the necessary milk-diet is exposed: it is unpalatable, monotonous, and clots of undigested casein are passed; tea, albumin water, Brand's Essence, etc., are preferable.

In chronic cases rectal lavage with ½ to 1 per cent. protargol or freshly prepared eusol is mentioned with respect. Vaccine treatment has been disappointing. Appendicostomy has not been generally satisfactory; caecostomy with an artificial anus in the right iliac fossa and the adjunct of a Paul's tube is the operation that provides for the large bowel the requisite rest.

In the complications and sequelae of bacillary dysentery the author speaks of tachycardia and collapse; arthritis—usually in Shiga infections —which occurred in 27 per cent. of a series of Egyptian cases; general oedema, in some Shiga infections; conjunctivitis, and even irido-cyclitis; parotitis; neuritis of legs, in some chronic cases; and intussusception of the large intestine.

In prevention of bacillary dysentery the danger of human carriers, even in hospital, is emphasized; after convalescence it is quite common for bacilli to be excreted for months. As regards the fly carrier, the author isolated the Shiga bacillus from flies in the solitudes of the Sinai desert. This bacillus cannot stand sun, but it can live in water, if not exposed to sun or putrefactive bacteria, for at least three weeks.

Amoebic Dysentery occurred at all seasons of the year and constituted about seven per cent. of all dysenteries in the Eastern theatres of war, being highest in Mesopotamia. Its well-known latency and chronic persistence were observed. The improvements in treatment discovered during the war, and the fine revolution worked in theories of amoeba-cyst incidence and distribution, are too well known to need repetition.

The two chapters on Malaria are of an extraordinary interest from many points of view.

Malaria in Macedonia, where in the three years 1916–18 the total admissions amounted to 160,000, has already been fully noticed in this *Bulletin*; so that it is sufficient to refer to a few points on its incidence elsewhere, and to the further experiences of clinicians and pathologists.

"A good illustration of what may happen when exposure [to malaria infection] takes place without any protection" was supplied by an incident in the Army of the Black Sea. Three hundred and five N.C.O's. and men of the Warwicks were encamped on the banks of a small stream at Varda, without mosquito-nets, etc., without quinine. In a fortnight's time cases of malaria occurred, so the whole detachment was removed to a healthy hill site near Tiflis, where subsequently all the rest of the men except two went down with the disease.

In Palestine and Egypt the number of admissions for malaria was about 35,000; the prevalent Anopheles carriers were *A. pharoensis* and *turkhudi* in Egypt, and *A. bifurcatus*, *maculipennis* and *superpictus* in Palestine.

In East Africa the admissions, 1916–17, numbered about 107,000, being 57·4 per cent. of total admissions for sickness. *A. costalis* and *funestus* were the chief carriers.

In Mesopotamia the admissions for 1917–19 were about 20,000, the most dangerous species of mosquito being *A. stephensi*. The British soldier was observed to be more susceptible than his Indian comrade.

The pathology of malaria deserves full consideration in this *Bulletin*. Of a number of fatal cases of subtertian, 57 per cent. died within two days of admission. In 50 post-mortem investigations the causes of death were 10 from heart failure, 10 from cerebral complications, 7 from haemolytic jaundice, 3 from hyperpyrexia, 13 from pulmonary complications, and 7 from concurrent disease, particularly dysentery. Among pathological changes are mentioned fine fatty degeneration of the heart muscle akin to that of diphtheritic toxaemia; loss of characteristic lipoids, thrombosis, and necrosis of the adrenal glands; spleen commonly engorged and diffluent, showing necroses of pulp and Malpighian corpuscles, occasionally only firm and slightly enlarged (spontaneous rupture of spleen has occurred); liver and kidneys with foci of necrosis and deposit of pigment in large clumps; intestine in algid cases generally congested, with petechial haemorrhages and scattered necroses of the mucosa; brain with extensive blockage of capillaries by parasites, thrombosis, and degeneration of nerve cells, but sometimes merely oedematous.

A strange assortment of symptoms and sequelae in subtertian cases is recorded: several instances of men being arrested as drunk or mentally deranged; among other cerebral phenomena hemiplegia, epileptiform convulsions, symptoms suggesting cerebrospinal meningitis, sunstroke—men on the march falling out and dying; vasomotor disturbances resulting in gangrene of feet; joint effusions resembling acute rheumatism, pains in the bones suggestive of chronic rheumatism or influenza; haemorrhages into the skin resembling purpura, typhus, and even measles; haemolytic jaundice with profuse bilious vomit as of yellow fever, or spirochaetous jaundice; cases resembling acute nephritis; general oedema and ascites without albuminuria; haematemesis, vomiting as of intestinal obstruction, dysenteriform and enteric symptoms; profuse vomiting and diarrhoea suggesting cholera, in algid cases; bronchial and pulmonary signs and symptoms which by some authorities were regarded as purely malarial. Some of these symptoms or complications—dysenteric, enteric, broncho-pneumonic and pneumonic—were sometimes also recorded in cases of benign tertian. The moral, duly emphasized, is that in a malarious country, though we should not mutter the ominous word "malaria" on every occasion, the patient's blood should always be carefully examined.

Though in the treatment of malaria, as in the account of symptoms and morbid anatomy, there may be nothing that is entirely new, yet the sublimated and condensed account of the careful clinics of hundreds of of thousands of cases in so many different countries has an inestimable value.

From all charges and controversies quinine emerges without a stain upon its own reputation, but we have learnt that it will not prevent relapses, particularly of benign tertian, and the old lesson has been repeated that it can do nothing in any circumstances if it is not absorbed.

In ordinary cases the routine treatment is a purge of calomel or blue pill, then a saline, then—if there are no gastric or intestinal difficulties—quinine *per os*, continued for at least three weeks, with the patient in bed for the first week. The salt preferred as the most soluble is the bihydrochloride. The dosage should be not less than 30 or more than 45 gr. per diem. During the second week quinine is more tolerable in an effervescing medium. After-treatment should extend to three months, and should include 10 gr. of daily quinine (given if necessary with HBr.), arsenic, and iron. In the management of the case the physician should be guided by frequent blood examinations.

When, owing to the gravity of the infection or the condition of the patient, quinine could not be given by mouth, intramuscular injections undoubtedly saved many lives and improved the chances of permanent cure. Owing to the destructive effect of quinine on muscle, this method should always be strictly aseptic and should not be employed in debilitated cases. The most generally approved treatment was 2 injections daily, for three days, of 6 gr. bihydrochloride in 1 cc. of distilled water, supplemented, if becoming possible, by quinine *per os*. Complete disappearance of

parasites from the blood and internal organs subsequent to administration of injections amounting to 36 gr. was observed at an autopsy.

The intravenous method is reserved for cerebral cases with coma or convulsions impending, 10 gr. of bihydrochloride in 10 cc. normal saline being the dose. As much as 60 gr. in 24 hours have been given by this method, but as a rule it is better to supplement the intravenous with the intramuscular method.

Rectal injection was not much approved. The subcutaneous method was practised by the French and also by us in East Africa: there is still the risk of sloughing, and otherwise it has no advantages over the intramuscular route.

Many other preparations of quinine were used, and also arsenical preparations. The latter undoubtedly destroy parasites and also are of use in the necessities of malarial anaemia and cachexia.

In certain cases of incurable malarial cachexia splenectomy was tried and was said by enthusiasts to lead to improvement; it certainly did not prevent relapses. Transfusion of blood was followed by some striking immediate improvement, being followed by leucocytosis and regeneration of red blood cells; so far as experience goes it ought to be repeated once or more, at fortnightly intervals.

Quinine poisoning was observed, but not after ordinary therapeutic doses. Twelve cases of permanent blindness were reported from Salonica, generally as a result of heroic doses; in one case after 135 gr. given in three days. There is, however, no evidence that a moderate anti-relapse treatment of 30–45 gr. a day causes blindness. Temporary blindness usually begins to pass off within 24 hours of stopping treatment, but some restriction of the field of vision probably persists in most cases. No evidence of permanent deafness was made known. Individual idiosyncrasy to quite small doses of quinine was observed. Other quinine phenomena noticed were rashes, ranging in intensity from erythema to purpura, and in two cases exfoliative dermatitis. Transient haemoglobinuria without pyrexia, followed by rapid anaemia, also occurred.

Some hundreds of cases of Blackwater occurred among white troops, but not among black, and also among Chinese coolies in East Africa; and 136 in Salonica, where the mortality was 26·5 per cent. Of the Salonika cases 116 were recorded during the months December to April, the maximum incidence being in February.

Some highly interesting facts and illustrations must be culled from the chapters on scurvy, beriberi, famine dropsy, and pellagra.

Scurvy occurred in a small way in several places, but to a serious extent only among Indian troops in the earlier days in Mesopotamia, where the admissions went up altogether to 14,479. It also occurred among some German prisoners of war in England, who, though receiving an adequate provision of vitamin, destroyed it by prolonged stewing. The discovery that lime-juice long kept has no antiscorbutic value, and even when fresh is much inferior to lemon-juice—and has in fact been allowed to misappropriate the reputation of lemon-juice, and the application of FÜRST's discovery of the antiscorbutic value of sprouting lentils (if but lightly cooked) are outcomes of the war.

Though Beriberi was limited in amount and felt chiefly in labour-corps of Orientals, 564 cases occurred in white troops in Mesopotamia, at a time when, by the misfortune of war, the rations consisted mainly of tinned beef and second-rate biscuits. This it was that lead to the confirmation of the prophylactic value of extract of yeast (marmite). The Indian troops in the same circumstances were untouched, thanks to their ration of *atta* (coarse flour) and *dhall* (pulse), substances rich in anti-beriberi vitamin.

In the British army, Famine Dropsy (a combination of oedema, polyuria, bradycardia and asthenia) was, it is needless to say, unknown—except in unhappy soldiers who had come out of certain German prisons. The scholarly article on this disease is—if one may forget the melancholy associations—one of the gems of the book.

Pellagra also was not much a matter for British troops ; but on followers and Turkish prisoners in Egypt it fell with sufficient force to evoke a most finished and illuminative investigation, which shows that no explanation of causation fits the facts, and receives support from all the circumstances, so well as the theory of "lack of sufficient biological value of protein."

The chapters on Typhus and on Trench Fever we have to leave, but with reluctance, as they illustrate so many things both material and spiritual, both squalid and heroic. Our exact knowledge of the one is considerably, of the other entirely, a part of the salvage of the catastrophe of the war.

The very fine chapter on the Enteric Fevers not only brings out the remarkable results of protective inoculation and the wonderful efficiency of the sanitary services—for in upwards of four years, in six theatres of war, and in an average mean strength given here as upwards of two millions, the sum of cases of enteric fevers was only 20,149 with a mortality of 1,191—but also exhibits the influence of the war in correcting and adjusting the views of the medical profession on this important subject. Though little has been done to modify treatment (for the value of vaccine is still *sub judice*), the experience of the war has established the fact that there is no essential difference in the morbid anatomy of typhoid and the paratyphoids, though in the paratyphoids the lesions are less intense, the complications are neither so frequent nor so serious, and the mortality is less by more than one-fourth. Equally in both when infection overtook men who had been inoculated the fever was lessened in severity and duration, so that an average typhoid case might be difficult to discriminate from a paratyphoid, and in an average paratyphoid case clinical evidence of enteric fever might even be wanting.

As already explained, we have taken but a particular survey of this remarkable official publication, but we hope to have conveyed some idea of its immense interest to the medical profession in the Tropics.

A. Alcock.

ROGER (G. H.), WIDAL (Fernand) & TEISSIER (P. J.). **Nouveau Traité de Médecine. Fascicule V. Maladies infectieuses et parasitaires (fin). Cancer.**—748 pp. With 35 figs. & 4 plates. Masson & Cie., Editeurs, 120, Boulevard Saint-Germain, Paris. 1922. [Price 50 fr. net.]

This volume forms part—albeit a very important one—of an ambitious work planned to embrace the whole range of medicine in 22 volumes of approximately equal dimensions. It is written in a straightforward, intelligible and easily assimilable style, admirably suited for students, and particularly well adapted for those readers who are not intimately versed with the intricacies of the French idiom. We note, as an innovation, the practice of recording the name of each contributor, or set of contributors, at the right hand bottom corner of a set of pages for which he or they are responsible.

The first part of the present volume, 339 pages, is a completion of infectious and parasitic diseases which have occupied the first four volumes of the series.

The first chapters, some 28 pages and 5 figures, are devoted to a consideration of soft venereal sore and ulcerating granuloma, by R. DEMANCHE. In the latter case considerable support is given to the claim of SOUZA-ARAUJO as to the specific nature of the *Calymmato-bacterium granulomatis* and to the efficacy of tartar emetic in this loathsome disease. The account of goundou by Ch. JOYEUX does not differ in any important particular from that in the other similar text books ; and the same may be said of Yaws (Pian et Bouba) by the same authority.

The section on relapsing fevers by such authorities as Ch. NICOLLE and L. BLAIZOT is a particularly pleasing production. Dealing with these fevers in general we may note that "tick fever" is described under a separate heading and that the subject is handled in a manner which differs

materially from that adopted in English text books on this disease; no attempt is made to differentiate minor clinical variations of the disease and to correlate them with geographical races or subspecies of the *Spirochaeta obermeieri*. Rat-bite fever, under its Japanese designation, "Sodoku" (*so*=rat, *doku*=poison), by D. THIBAUT, is an up-to-date account of the subject with temperature charts and illustrations. It is founded mainly upon the researches of FUTAKI, TAKAKI, TANIGUCHI and OSUMI, published in the *Journal of Experimental Medicine*.

Malaria, occupying 106 pages, with 9 text figures and 2 coloured plates, is contributed by H. VINCENT and J. RIEUX. The historical aspect of the subject is fully treated and is one around which very considerable contemporary interest centres. Full recognition is given to the work of LAVERAN in 1880 and little can now be added to his account written at that time:—"*La relation qui existe entre la présence dans le sang des nouveaux parasites que j'ai décrits et les accidents de l'impaludisme me paraît indiscutable.*" To LAVERAN is given the credit of suggesting, in 1891, that mosquitoes could play a part in the transmission of malaria. It seems to us a very grave omission that the part, and to most minds a leading part, played by Patrick MANSON, throughout the whole of this memorable epoch, should have been passed by without recognition; indeed, we have searched for his name in vain.

Blackwater fever, by the same authorities, is treated in a separate chapter; they agree with FIRKET in regarding it as an "accident paraparludéen," and give very considerable, and, to our minds, unjustifiable prominence to the quinine theory of its causation. Few modern authorities, basing their opinions on war experience, would be ready to bear out the figures of CARDAMATIS upon the deleterious action of quinine in the treatment of this disease.

Kala azar, by Ch. NICOLLE, is very briefly treated within the space of five pages. The typical temperature chart has been omitted and treatment is dismissed in eight lines. The subjects of oriental sore and espundia are equally briefly described in three pages. One is impressed with the disproportionate handling of the subject matter, for, on turning to trichinosis, by Ch. JOYEUX, a disease which, however important as a classical example of parasitology, is one of but little contemporary interest, we find a very full account spread over 17 pages, where treatment of an infection for which no specific remedy has, as yet, been forthcoming is handled at length.

The chapter on filariasis by J. GUIART is particularly disappointing. The account is to a great extent a translation of the classical description in Manson's Tropical Diseases. But little prominence is given to the geographical peculiarities of filariasis or to the interesting speculations aroused by the discovery of the non-periodic variety, of *F. bancrofti*.

Strongylosis, distomatosis, coccidiosis and the quite exceptional sarcosporidiosis are also described by GUIART. We may note the prominence attributed to human infections with *F. hepatica*. GUIART maintains that this is a far commoner parasite of man than has hitherto been thought to be the case. In the account of coccidiosis, nothing new has been added to the well-known work of DOBELL.

The subjects of echinococcosis, hydatids and cysticercosis are all treated by F. DÉVÉ. They appear to be adequate and accurate.

Prof. E. BRUMPT handles human trypanosomiasis in an eminently full and creditable fashion, and we may note, on page 297, the first published text-book account of the new remedy, "Bayer 205." It is recorded that this drug is innocuous, as much as 8·2 gm. have been injected intravenously, without visible detriment, within a space of 16 days.

The account of Chagas' disease is based, to a great extent, upon the author's own studies. It is by far the most complete and authoritative text-book account we have yet seen. He evidently gives little credence to the association of gross abnormalities of the thyroid gland with the presence of *T. cruzi* in the blood, and we are provided with his views

upon the evolution of the leishmania-like bodies from the true trypanosome forms.

Bilharziasis, again by BRUMPT, fulfils expectations; but it may be remarked that some of the illustrations require amendment—for instance, fig. 1 on page 315, the time-honoured figure of *S. haematobium* after LOOSS, obviously represents *S. mansoni* according to modern conceptions.

The second portion of the volume, comprising 408 pages, consists of a treatise on cancer by Gustave ROUSSY and Maurice WOLF. The numerous illustrations are excellent and the whole account is a most creditable study of the biology, anatomy, symptomatology, experimental reproduction and therapeutics of carcinoma. It is probably in its way a unique work, for certainly within recent years no account has appeared in French or any other language which treats of this subject in such a thorough and comprehensive manner; for this achievement the authors are to be congratulated.

We again emphasise that common omission, so often voiced on French standard works, namely, the absence of a general index; an omission which robs this excellent volume of much of its usefulness.

Regarding the illustrations as a whole, they can be assessed as good in accentuating the main points, but the photographic reproduction is poor. Too much use has been made of the now familiar text-book illustrations. Plates 1 and 2 of the malaria parasites are accurate in the main, though the actual coloration appears too gaudy.

Philip Manson-Bahr.

VAN THIEL (Pieter Hendrik). **Anopheles en malaria in Leiden en naaste omgeving.** [Anopheles and Malaria in Leiden and Near Surroundings.]—98 pp. 1922. Leiden: Eduard Ijdo.

In this well-written thesis van Thiel gives the results of his careful and elaborate researches on malaria-carrying mosquitoes, and the epidemiology of malaria; and also deals with the historical aspects of the subject in Leyden.

The following explanations may be given of the cases of malaria which occur in the early part of the year.

(*a*) Infection may take place in the autumn and the attack of malaria may not develop until after a prolonged incubation period of 6–11 months. Experience during the great war has proved that this certainly may happen.

(*b*) Infection may be transmitted by hibernating mosquitoes which leave their hiding places in the first warm days of spring and suck blood from people with latent malaria. Although theoretically a sound hypothesis, the practical objections against it are that such latent cases of malaria do not have sufficient numbers of gametocytes in their blood to cause infection, and secondly that only seldom in winter and spring are blood-filled mosquitoes found.

(*c*) A third possibility is an infection in the spring by mosquitoes infected in the previous autumn. Up to quite recently, no one had been able to demonstrate normal sporozoites in the salivary glands of mosquitoes during the winter, but SWELLENGREBEL detected them, in January and February, 1921, in mosquitoes in Amsterdam, and quite a new aspect of this question of "overwintering" of the sporozoites is given by the researches of WENYON, MÜHLENS and MAYER. These researches have raised the question of the sporozoites surviving during the winter in other parts of the mosquito than the salivary glands. In the Anopheles caught in and near Leyden the author has never been able to find sporozoites in the salivary glands during winter. He has, however, noted the presence of the pseudo-sporozoites first described by GRASSI (1901).

As important epidemiological factors with regard to the marked decrease of malaria during the last century in civilized countries, the author

mentions the improved hygienic conditions, the cultivation of land, whereby the breeding places of Anopheles are destroyed, and the improved cattle sheds.

T. Joekes.

CARAZZI (Davide). **Parassitologia Animale.**—II Ed. 8vo. pp. xii + 467. With 4 plates (3 coloured) and 235 figures in text. Milano (Società Editrice Libraria), 1922. [Price L.75.]

This attractive volume is, as we learn from the title-page and prefaces, the second edition, "corrected and enlarged," of a work which appeared originally in 1913. Its scope is sufficiently explained by a somewhat lengthy sub-title indicating that it deals with "animal parasites of man, and animals which transmit parasitic diseases to man and domestic animals, with technical directions for the collection, preparation, and macroscopic and microscopic study of parasites." Its distinguished author has for some years occupied the Chair of Comparative Anatomy in the Royal University of Florence, and those who know anything of his other writings will expect to find the subject handled with skill and insight of no ordinary kind: they will expect to find originality and precision combined with common sense and uncommon critical ability. And in none of these things will they be disappointed. Moreover, the author possesses a limpid style and a mastery of his own language which is impressive even to a foreigner. He is often dogmatic and caustic in his criticisms, and even occasionally—one may be allowed to think—quite wrong; but he is never dull—not even when he writes of colloids, nomenclature, anti-malarial measures, and other matters which afford ample opportunities for the tedious and long-winded compiler.

The work is divided into three main parts, dealing respectively with the Protozoa, the Worms, and the Arthropods. Each section is subdivided into a number of chapters, in which the organisms are described in systematic order, and anything of particular parasitological or general importance connected with them discussed at length. It is self-evident that no man can claim, at the present day, to be authoritatively expert in the three sciences of Protozoology, Helminthology, and Entomology, each of which is more than enough to require the undivided attention of a lifetime. It was possible, perhaps, in the days when LEUCKART attempted to learn all that could be learnt about the animal parasites of man; but even he did not succeed in mastering the whole subject. Still less did BRAUN, who came after him, ploughing the same furrows afresh. Consequently, the man who now undertakes to work over the whole field is bound to go astray here and there. The specialist, in each subject treated, will find him now and then out of date, misinformed, and errant in judgement. But this is inevitable, and does not outweigh the manifest utility of a book of this comprehensive scope. Furthermore, it is clear that if considerations of this sort apply to the author, they apply no less to the reviewer of such a book. It is easy for him to pick out and criticize what he regards as errors in the treatment of his own special subject; but it would be absurd for him to think that, when he had done so, he had really made any useful criticism of the work as a whole. It thus seems to the present reviewer that the best thing he can do is to indicate the contents of the work before him, instead of attempting to criticize those details of it with which he is more or less competent to deal.

In a brief "Introduction" the author lucidly writes of "animal parasitology and its importance in modern medicine"; of "parasitic animals and plants and the divers sorts of parasitism"; "of zoological classification and the concept of species"; and of "the main subdivisions of the animal kingdom." Chapter I then deals with "the cell" and "protoplasm" in a general manner (though not wholly along conventional lines), and prepares the way for Chapter II on "the morphology and physiology of the Protozoa." The next four chapters describe, in order, the Flagellates Rhizopods, Coccidia, and Haemosporidia. Of special interest to

readers of the *Bulletin* are the three following chapters, which deal respectively with "the prophylaxis of malaria," "the mosquito-malaria theory" and "the malarial problem in the light of recent researches (1915–1921)." Those who have read Professor Carazzi's shrewd comments on these subjects in the *Rassegna delle Scienze Biologiche* during the last few years will be prepared for much of what he has here to say: those who have not are earnestly recommended to do so, in addition to studying these chapters in the present volume. Stated briefly, his thesis is that malaria can be stamped out, but not by merely killing mosquitoes and taking quinine. He puts more trust in irrigation on a large scale, and the intensive agricultural development of malarious districts. The remainder of the first part of the book is devoted to the Sarcosporidia, the Ciliata, and "pseudo-protozoa and doubtful forms" (including the spirochaetes); and it ends with a chapter on the technique of practical protozoology.

Part II, dealing with the "worms," follows similar lines. The chapters treat successively of the Trematoda, the Cestoda, the Acanthocephala, the Nematoda, and the Gordiacea and Hirudinea; and a chapter on technique again terminates this part. The illustrations in this section of the book are particularly good, and many of them are original. In an appendix to Chapter XVI (Nematoda) the thesis is upheld that "there is undoubtedly a type of simple appendicitis (*i.e.*, one that is non-suppurative, and not complicated by perityphlitis), which is helminthic in origin."

In the third and last part of the book the Arthropoda are reviewed in a similar manner, successive chapters describing the Arachnida (Acarina, Linguatulidae), the Myriapoda, and the Insecta (flies, fleas, lice, and bugs). After a chapter on technique, this part concludes with a useful—though obviously somewhat misplaced—account of the "birds and mammals which harbour parasites that convey diseases to man." The subjects dealt with are Psittacosis; rats, marmots, etc., and rat destruction; and finally, the transmission of plague.

The whole book is well printed on good paper. The illustrations are, for the most part, good and clear, and there is an adequate index. But, with the exception of an occasional note, there are no references. In his preface the author tells us that the addition of an appropriate bibliography would have swelled his volume to double its present size, and as he has no love for the excessively big book—a reprehensible German fashion, he says, which has unfortunately already spread to Italy—he has preferred to give no bibliography rather than do the thing by halves. One sympathizes with him in this, but adequate references very greatly increase the value to the student of a work of this sort, and one cannot but regret that in this excellent treatise—as in the well-known work by Brumpt covering much of the same ground—the bibliographic aspects of the subject have received such scant attention. Apart from this, one can have nothing but gratitude for an author who, as in the present case, possesses not only the will but also the ability to compress so large and complex a subject into so small a compass.

A witty and learned Czech has somewhere said—if memory serves—that Science is merely a *Fach* for the Germans, a branch of *belles lettres* for the French, but a *sport* for the English. He did not say what it is for the Italians; but had he taken the present volume as a type of their scientific products, he would probably have concluded that they possess all the good qualities which seemed to him to have developed into defects in the three other nations. The work before us is, indeed, in many ways a model, showing how one may write scientifically without being pedantic, and write beautifully without even a trace of affectation; while the sporting element may perhaps be discerned in the fair and courageous criticisms and the occasional gleams of humour which the careful reader will not fail to note, and which impart an engaging air of freedom and independence to the whole work. It is, in short, a good book, written by a good biologist.

Clifford Dobell.

HIRST (Stanley) [Assistant Keeper, Department of Zoology]. **Mites Injurious to Domestic Animals.**—*British Museum (Natural History)*, Economic Series No. 13. 107 pp. With 85 text figs. 1922. London: Printed by Order of the Trustees of the British Museum. [Price 3*s*.]

This book on mites injurious to domestic animals will be very useful to the medical man, if only for the large number of wonderfully clear and good figures representative of all the families of pathological interest except the ticks, which last are promised in another volume of the series. The instructions for mounting mites for examination by microscope will also be found useful. The book is well printed and is provided with a good index, and is a credit to everybody concerned in its production; it adds another item to the debt which all who are concerned with medical zoology owe to the British Museum.

A. Alcock.

KENNETH (John H.) [M.A.]. **Osmics. The Science of Smell.**—42 pp. 1922. No. 1 Edinburgh: Oliver & Boyd. [Price 2*s*.]

This pamphlet is composed of a note, an introduction, a bibliography, an index of bibliographical references, and an index of animals.

Everyone must have experienced the truth of the saying that nothing recalls forgotten scenes and places more vividly than our sense of smell—a fact of common experience expressed in the quotation "Smells are surer than sounds or sights to make the heart-strings crack," which forms the text of the author's prefatory note. Out of this original touch of nature that makes the whole world kin the author's eye, fixed on material appliances, bodies forth an Institute of Osmics, with physiologist, psychologist, chemist, zoologist, botanist, anthropologist, pathologist, rhinologist and statistician all at work, and embryologist, geneticist, and palaeontologist in waiting.

In the introduction the terminology of the matter is explained. "Osmics is the science of the stimuli, organs, and the sense of smell." Substances that emit smells are "osmyls." Organs that receive and translate the messages sent by the osmyls are "osphrenes." In the introduction also some applications of osmics are mentioned, most of them of a rather serious kind.

The prefatory note and the introduction are, however, minor items. The bulk of the pamphlet—38 out of its 42 pages—consists of the bibliography and its indexes. The bibliography extends to 500 separate entries, and is interesting and valuable. Extensive as it is, it can hardly be complete, since it does not include any reference to DARWIN's "Descent of Man," or to DARWIN's references to the observations of HUMBOLDT and of HOUZEAU, or to the remarks of MAUDSLEY.

A. Alcock.

CUBA. **V. Congresso Medico Nacional. IV. Congreso de la Prense Medica.**—*Cronica Med. Quirurg. de la Habana.* 1922. Jan. Vol. 48. No. 1 (Special No.). 343 pp. Illustrated.

This volume of nearly 350 pages, with numerous illustrations, is devoted to a report of the Fifth National Medical Congress of Cuba, but deals largely with the social aspect of the Congress.

In the scheme of papers to be read there are 23 in the Tropical Medicine section, while several in the General Medicine section also are of interest to workers in the tropics. Unfortunately, however, in the latter part of the volume, in which several papers are given in extenso, only two deal with tropical conditions, namely, one by Professor HOFFMANN, on the Histological Changes in Experimental Infection with *Leptospira*

icteroides and *L. icterohaemorrhagiae*, which has already been reviewed in this *Bulletin*, Vol. 19, p. 565, and one on the Mortality Statistics of Yellow Fever in Cuba in the latter half of the 19th century. A brief résumé is given of a third paper on Yellow Fever, in which it is stated that in the discussion which followed Drs. GUITERAS, AGRAMONTE and LEBREDO "expressed the opinion that the facts as known at present are against the acceptance of the *L. icteroides* of Noguchi as the causal agent of yellow fever."

As regards the mortality statistics of yellow fever these are in part hypothetical, since accurate records have not been kept during the whole period dealt with. The estimated total is given as 110,418. During the period 1854 to 1879 there were 29,003 deaths among the civil population, and between 1854 and 1897 among the Spanish soldiers, 37,698 died. In Havana alone there were 36,575 deaths in the 50 years from 1853 to 1902.

Yet one other contribution, a paper by Dr. PIÑERO read in the Medico-legal section, is of interest to district medical officers and others practising in the tropics who may at any time be called upon to give evidence in a court of law, when a body has been found in the water, as to whether the person had died from drowning or not. A new test is described which is quite simple to carry out. The apparatus employed consists of a U-tube, 52 cm. in length and 13 mm. in internal diameter, mounted on a wooden stand. The limbs are graduated in centimetres. A mixture of benzol and chloroform of specific gravity 1,050, or about that of the blood, is poured into the level of the top of the graduations. With a thoroughly dry pipette blood is taken from the right side of the heart and a drop allowed to fall into the fluid in the right limb of the apparatus, care being taken that it does not touch the sides. With a second pipette a drop from the left side of the heart is similarly allowed to fall into the left limb.

Dogs were used for experimental tests. If killed by immersion in fresh water the blood from the left side of the heart was found to be of less density than that from the right, and the difference of level in the two limbs was from 1 to 1·5 cm. If drowned in salt water the blood from the left side was found to be of greater density than that from the right, the difference being almost constant, 1·5 cm.

Other dogs were killed by puncture of the bulb and then submerged for 10 hours, some in fresh, some in salt, water. The drops from the different sides of the heart remained at the same level, for the difference was very slight (3 mm.). The author claims that by this simple means a definite answer can be given to the question: "Did the person found in the water die from drowning, or was the body thrown into the water after death?"

H. Harold Scott.